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MAINTAINING THE QUALITY OF ENERGY STATISTICS FOR ECONOMIC AND ENERGY ANALYSIS

STUDIES

PREPARED FOR THE USE OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

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LETTERS OF TRANSMITTAL

August 5, 1982

To the Members of the Joint Economic Committee:

Transmitted herewith is a volume of studies entitled "Maintaining the Quality of Energy Statistics for Economic and Energy Analysis," which was prepared at my request by the Congressional Research Service for use of the Joint Economic Committee, Congress of the United States.

The chapter on The Use of Energy Statistics for Economic Analysis was prepared by David J. Cantor, Analyst in Industry Economics, Economics Division; The Effect of Proposed Budget Cuts on Energy Information Administration's Analytical Function by Larry Parker, Analyst in Energy Policy, Environment and National Resources Policy Division; and The Effect of Proposed Cuts in the Data Validation Program at the Energy Information Administration by Royce Crocker, Specialist in American National Government, Government Division. The appendix, Issues and Problems Connected with Contracting in the Energy Information Administration was prepared by Susan R. Abbasi, Specialist in Natural Resources Policy, Environment and Natural Resources Policy Division.

The views expressed in this volume are those of the authors and do not necessarily represent the views of the Joint Economic Committee or of its members.

Sincerely,

Henry S. Reuss
Chairman
Joint Economic Committee

August 5, 1982

Honorable Henry S. Reuss
Chairman, Joint Economic Committee
Congress of the United States
Washington, D.C.

Dear Mr. Chairman:

Transmitted herewith is a volume of studies entitled "Maintaining the Quality of Energy Statistics for Economic and Energy Analysis," which was prepared by the Congressional Research Service as a part of the Committee's review of the adequacy of the Government Economic statistics.

Assistance in the preparation of the report was provided by Dr. Courtenay Slater, President, CEC Associates, Inc. under contract with the Joint Economic Committee and Dr. Paul Manchester and Timothy Edwards (Congressional Assistance Program) of the Committee staff.

Sincerely,

James K. Galbraith
Executive Director,
Joint Economic Committee

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LETTER OF SUBMITTAL

August 4, 1982

Honorable Henry S. Reuss
Chairman, Joint Economic Committee
Congress of the United States
Washington, D.C. 20510

Dear Mr. Chairman:

I am pleased to submit four papers requested by you on the subject of energy statistics for economic and energy analysis.

These papers provide an analysis of the capability of the Energy Information Administration (EIA) of the U.S. Department of Energy to furnish reliable energy data and analyses of the country's energy situation and its implications for the national economy. The first paper assesses the usefulness of EIA energy statistics for compiling national income and product accounts. The second paper appraises EIA's capability to perform energy analysis in the light of organizational changes and budget reductions. The third paper examines contracting and personnel issues within EIA. The fourth paper deals with the implications of reduced budget levels for the data validation function within EIA.

These papers are the product of an interdivisional effort of the Congressional Research Service. Participating in the project were: David J. Cantor, Analyst in Industry Economics, Economics Division; Larry Parker, Analyst in Energy Policy, Environment and Natural Resources Policy Divison; Susan R. Abbasi, Specialist in Natural Resources Policy, Environment and Natural Resources Policy Division; and, Royce Crocker, Specialist in American National Government, Government Division. Overall project coordination was provided by David J. Cantor.

We hope that these papers will serve the needs of the Committee as well as those of the Congress as a whole.

Sincerely,

Gilbert Gude
Director

Foreword by Chairman Henry S. Reuss

Global energy events of the past decade have forced Congress to realize the significance that energy information has on the economic well-being of the United States and the world. The shift from domestic to imported oil, the Arab embargoes of 1973 and 1979, periods of supply shortages and glut, price hikes, price adjustments, price decontrols and war have profoundly altered the course of our economic and political history. They have generated, at times, deep conflicts between Congress and successive administrations regarding national Energy Policy. The key to resolving these conflicts has been, and continues to be, good energy information.

In 1977, Congress established the Energy Information Administration (EIA) with the passage of the Department of Energy Organization Act (P.L. 95-91). EIA became the primary source of all energy information within the government. Previously, EIA's responsibilities had been fragmented among several different agencies.

On December 17, 1981, the Administration proposed that the Department of Energy (DOE) be reorganized, and that its functions be transferred to the Departments of Commerce, Justice, Agriculture, Interior and the Federal Energy Regulatory Commission.

The Fiscal Year 1983 energy budget request (S.2562) proposed legislation to repeal energy information requirements and requested reductions in energy information and analytical services activities.

EIA's efforts to develop and maintain new and existing information systems would be cut back drastically under the President's Fiscal 1983 budget. Major information validation functions and analytical studies would be reduced and in many cases eliminated.

EIA has information which is important for economic analysis in both the public and private sectors. The current Administration's proposals would severely limit EIA's ability to perform its function. They would cause the potential elimination of critical energy economic information; hamper EIA's in-house personnel development; and constrict the capacity for validation of existing EIA data. In short, the Administration proposes a return to the earlier, highly unsatisfactory, situation of reliance on private sources for much energy information.

These studies assess the usefulness of EIA energy statistics for compiling national income and product accounts, appraise EIA's capability to perform energy analysis, evaluate EIA's data validation functions and examine contracting and personnel issues. They detail the effect of the Administration's proposed energy budget cuts and requested DOE reorganization. I hope that wider appreciation of the extent of the Administration's proposals will help ensure that steps are taken to preserve vital production of energy statistics for both economic and energy policy analysis.

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CHAPTER I

THE USE OF ENERGY STATISTICS FOR ECONOMIC ANALYSIS*

One of the functions of the Energy Information Administration (EIA) of the Department of Energy is to furnish data to other federal agencies, on their request, which they may use to execute their functions. Although EIA's primary function is the collection of data on the energy situation of the country and assessment of its economic and social effects, the intent of Congress was that EIA should be the central source of all energy data within the government. 1/ To fulfill all of its responsibilities, EIA collects energy data on 102 forms, maintains 57 information management systems to process the data, and issues 58 regularly scheduled reports. 2/

EIA has, in fact, established data collection instruments and information systems to enable it to supply energy information to several governmental agencies. The Bureau of Labor Statistics obtains monthly electric bill data from EIA for use in compiling the Consumer and Producer Price Indexes. The Economic Regulatory Administration of the Department of Energy and the Federal Energy Regulatory Commission obtain data from EIA to facilitate their regulatory functions. U.S. government reports to the International Energy Agency are prepared using data data collected on at least two EIA forms. The U.S. Geological Survey, Environmental Protection Agency, Departments of Commerce and Labor, Council of Economic Advisers, and the Board of Governors of the Federal Reserve System are other agencies identified as recipients of EIA data.

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* Prepared by David J. Cantor, Analyst in Industry Economics, Economics Division.

1/ Public Law 95-91. Department of Energy Organization Act. Section 205.

2/ Energy Information Administration. Directory of Energy Data Collection Forms. March 1982.

The issue addressed in this report is the usefulness of the data collected by EIA for purposes other than energy analysis and specifically for economic analysis. EIA's fulfillment of its mandate to furnish data is not under review here. The view has been expressed that these data have limited use for economic analysis. In particular, questions have been raised whether EIA data have substantial applications in compiling the basic accounts for analysis of the economy, namely, the National Income and Product Accounts and the official input-output tables of the U.S. economy, both products of the Bureau of Economic Analysis of the Department of Commerce. 3/

In principle, EIA's data bases contain a large amount of information which can be utilized for economic analysis. In particular, much of the data could be used in compiling the national income and product accounts and in developing the input-output tables, which describe the interactions among industries in the economy. In addition, the legislative requirement that EIA shall report on the financial status and competitive structure of the energy industry results in a detailed economic analysis of this industry. 4/

A related issue in this discussion is the effects of budgetary cutbacks and administration decision to eliminate or modify certain data bases. EIA has seen its budget reduced from $90.4 million in FY81 to $78.9 million in FY82 to $54.5 million in FY83 as proposed by the Administration. The budget reductions that have already been put into effect have resulted in several retrenchments and postponements of data collection activities; e.g., the residential buildings energy consumption survey will not be undertaken annually as has been EIA's practice to date. In addition, in cases in which regulations have been eliminated, EIA has either eliminated or modified data collection forms which had

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3/ Committee on Governmental Affairs. United States Senate. Committee Print. Energy Information. A Workshop on Current Progress and Problems. June 1980. p. 25.

4/ Public Law 95-91. Section 205 (h).

been used to acquire data to meet regulatory requirements. Also, some data collection activities have been cancelled by the Office of Management and Budget under its authority to approve forms used by EIA; e.g., the industrial sector energy consumption survey. To the extent that these actions result in the elimination of energy data which could be employed in economic analysis, then the usefulness of EIA data for this purpose is impaired.

The elimination of the Financial Reporting System (FRS) under the FY83 budget deserves mention. FRS collects and analyzes data on the financial performance and competitive structure of major energy producing companies, as required by Section 205(h) of the Department of Energy Organization Act. Notwithstanding the provisions of the law, this system and its underlying data bases will be abolished. Thus, this important source of information on the competitive structure of the industry based on official data will disappear.

In addition to evaluating the usefulness for economic analysis of the data collected by EIA, consideration is given to the adequacy of EIA's information management systems to compile and generate information for this purpose. Literally thousands of data elements are collected on the 102 forms used by EIA. To access these data and to provide analytical reports and information based upon them, EIA maintains 57 information management systems. Assuming that data useful for economic analysis are collected, EIA must still be able to process these data before they can be put to this use.

This report discusses each of these subjects in turn. Its first and second sections discuss the usefulness of the energy data collected by EIA and processed by its information management systems for the national income and product accounts NIPA) and input-output analysis, respectively. The third section assesses the implications of reductions in data collection for economic analysis. The fourth section examines as a special case the implications of the elimination of the

Financial Reporting System. Finally, the fifth and concluding section considers generally the use of energy data for economic analysis by government and private entities.

The principal findings in this report are:

(i) A substantial number (65) of the data collection forms employed by EIA obtain data in a timely manner which can provide inputs to NIPA and official input-output tables of the U.S. economy.

(ii) Some existing EIA data bases and systems provide information to the Department of Commerce, Department of Labor, and other government agencies. EIA data bases are employed also by private sector users for both energy and economic analysis.

(iii) EIA's data management systems have limited capability for processing data for NIPA or input-output tables. In virtually all cases, these systems generate information for energy analysis (including regulatory functions) only.

(iv) Although there would appear to be overlapping data collection efforts (i.e., the same data are being collected on two or more forms), this apparent duplication facilitates data validation and revisions.

(v) The elimination of the Financial Reporting System implies the loss of some data which could be of use in constructing the national input-output tables.

(vi) The elimination or modification of other data collection instruments could have limited adverse consequences for the construction of NIPA or input-output tables.

I. EIA Data and the National Income and Product Accounts (NIPA)

The U.S. National Income and Product Accounts (NIPA) measure the country's production, income resulting therefrom, and income distribution. They are, in effect, the most comprehensive quantitative indicator of the country's economic health. To be most useful for compiling NIPA, data must capture both output in physical terms and its value. In addition, it must be timely, owing to the quarterly estimation schedule of national income and product.

(a) EIA's Data Bases and NIPA

Approximately 35 percent of the data-gathering forms collect observations which contribute to the computation or validation of components of the U.S. national income and product accounts. 5/ These forms provide data on the energy sector's physical output and/or its value. They furnish the value of energy components of personal consumption expenditure and, in some cases, of capital investment in the energy sector. Profits of energy industries are obtained from some forms, the value and quantity of imports from others, and inventory investment by both energy-producing industries and manufacturing industry in general from more than ten forms. The data are collected on a quarterly or more frequent basis. These forms and their element(s) of NIPA to which they could provide data are identified in Table 1; a complete listing of EIA forms is presented in Appendix I.

Many of these forms would seem to overlap. (For example, Forms EIA-SG-1, EIA-SG-2, and EIA-SG-4 all collect data on retail gasoline sales. The periodicities of these three forms differ, as do the number of respondents to each. EIA-SG-1 collects data quarterly from 2000 retailers; EIA-SG-2 collects data annually from 720 retailers; and, EIA-SG-4 collects data from 52 retailers monthly.) The apparent duplication provides, however, a means for ensuring the quality of the information obtained, the information from the quarterly and annual submissions being used to validate the monthly data. The target number of respondents and their selection is determined by accepted statistical sampling methodology.

Not all of the information collected from the various forms can be utilized directly in NIPA, because many forms obtain data only on physical quantities of energy resources and products rather than on aggregate or unit value. Although

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5/ Energy Information Administration. op. cit.

Table 1. Data Collected by Energy Information Administration of Potential Use in Constructing National Income and Product Accounts (NIPA)

EIA Form and Title		Frequency of Reporting	Use in NIPA *
EIA-SG-1:	Survey of Gallonage Sales of Gasoline	Quarterly	Q
EIA-SG-2:	Survey of Gallonage Sales of Gasoline	Annual	Q
EIA-SG-4:	Survey of Gallonage Sales of Gasoline	Monthly	Q
EIA-5:	Coke Plant Report--Quarterly	Quarterly	Q,I
EIA-9A:	No. 2 Distillate Price Monitoring Report	Monthly	P,Q,I
EIA-14:	Refiner's Monthly Cost Report	Monthly	P,Q
EIA-64:	Natural Gas Liquids Operations Report	Monthly	P,Q
EIA-67:	Foreign Crude Oil Cost Report	Monthly	P,Q
EIA-87:	Refinery Report Supplement	Monthly	Q,I
EIA-88:	Bulk Terminal Stocks Report	Monthly	Q,I
EIA-89:	Pipeline Products Report	Monthly	I
EIA-90:	Crude Oil Stocks Report	Monthly	T,I
EIA-101:	Monthly Residential, Commercial and Industrial Electric Bill Data for the U.S. Bureau of Labor Statistics Price Indexes	Monthly	P
EIA-141:	National Survey of Fuel Purchases for Vehicles-Purchase Log and Supplementary Questionaire	Monthly	C
EIA-142:	International Energy Agency Emergency Supply Report	Monthly	C
EIA-161:	Weekly Refinery Report	Weekly	Q,I,T
EIA-162:	Weekly Pipeline Stocks of Finished Products	Weekly	I
EIA-163:	Weekly Pipeline Stocks of Finished Products	Weekly	I
EIA-164:	Crude Oil Stocks Report	Weekly	I
EIA-165:	Imports Report	Weekly	I,T
EIA-191:	Underground Natural Gas Storage Report	Monthly	Q,I

* Legend at end of Table (next page)

Table 1. Data Collected by Energy Information Administration (EIA) of Potential Use in Constructing National Income and Product Accounts (NIPA)-continued

EIA Form and Title		Frequency of Reporting	Use in NIPA *
EIA-194:	Incremental Price Report	Monthly	P,Q
EIA-254:	Quarterly Progress Report on Status of Reactor Construction	Quarterly	K
EAI-456A:	Crude Oil Ownership Report	Monthly	I
EIA-460:	Petroleum Product Monthly Report for Product Prices	Monthly	P
EIA-759:	Monthly Powerplant Report	Monthly	Q,I
EP-119M:	Monthly Report of Electric Energy, Capability, and Peak Load	Monthly	Q
ERA-51:	Transfer Pricing Report	Monthly	P,Q
ERA-60:	Report of Oil Imports into the United States and Puerto Rico	Monthly	T
ERA-182:	Domestic Crude Oil First Purchaser's Report	Monthly	P
FERC-5:	Electric Utility Company Monthly Statement	Monthly	Q,P,K
FERC-11:	Natural Gas Pipeline Monthly Report	Monthly	Q,P
FPC-8:	Underground Gas Storage Report	Monthly	Q,I
FPC-423:	Monthly Report of Cost and Quality of Fuels for Electric Plants	Monthly	P,Q

* Legend: P-price; Q-physical output; C-consumption; I-inventories; T-foreign trade; K-capital investment

Source: Energy Information Administration. Directory of Energy Data Collection Forms. March 1982.

these data can be used to verify the accuracy and/or reliability of data from other forms which collect both volume and value, those forms which assemble information only in terms of physical volumes of energy would have to be combined with price data obtained elsewhere by EIA to produce dollar values of output. The problem with compiling information useful for NIPA from forms which deal only with physical quantities and others containing price and/or value observations is simply that EIA has no data management system in place to accomplish this task.

(b) EIA's Information Management Systems and NIPA

This examination of EIA's data collection efforts indicates that the agency assembles a vast amount of data which could be of use in constructing the country's National Income and Product Accounts. The agency has not, however, organized these data into systems to take full advantage of this potential use.

EIA maintains 57 information management systems. Each system compiles data from one or more forms from which various reports can be generated. The list of these systems and their associated forms is presented in Appendix II. In every instance, the systems are intended solely for energy analysis; that is, to provide information on production, reserves, capacity, disposition, and pricing of energy. In no case, does a data system maintained by EIA utilize forms which could conveniently provide input to NIPA.

The lack of a data management system in place to furnish NIPA data does not mean that one could not be designed and implemented to accomplish this task. Conceptually, a data management system contains in its simplest form three elements: (1) input files, (2) output files, and (3) a processor (or assembler/compiler) of the data. The input files contain facts, which by themselves provide little or no information. The output files provide information desired by the user.

The processor selects from the former the necessary facts and assembles them into the latter. Any system designed to provide inputs to NIPA would clearly be more complex. Sub-systems would have to be created to extract from the several EIA data bases (the input files). The processor in this case would not simply assemble the extracted facts, but would have to perform computations to arrive at the output which would be entered into NIPA. In addition, the processor possibly would perform operations for purposes of data validation and input/output file revisions. The output files would have to be formated to be compatible with the Commerce Department's data systems.

An example of such a system could be the calculation of personal consumption expenditures for electricity. Form EIA-101 provides data from 175 electric utilities on monthly electric bills by type of end user including residential. This form yields information on price per kilowatt hour to each type of user. Form FERC-5 collects monthly data on kilowatt generation and sales by end-use classification from 140 utilities. These could comprise the primary input data. The processing of these data would involve the multiplication of price and quantity, the products going into an output file, providing the basis for estimating the agregate value of personal consumption outlays for electricity. Data validation could be performed along with annual revisions using data from EIA-213, which collects pricing data from 1250 utilities, FPC-12, which collects end-use consumption from 623 utilities, and EIA-457E, the annual residential energy consumption survey (electricity).

To obtain these data on personal consumption expenditures for electricity, a new system would have to be designed. At the present time, the two primary input forms are not used together in any existing EIA data management system. In other cases, existing systems could be modified to extract data in usable form for NIPA. For example, system 6615 (3): Fuel Purchases for Vehicles provides value of house-

hold gasoline purchases monthly from a sample of 6,000 individuals, which would be valuable in estimating this component of personal consumption expenditures.

II. EIA Data and Input-Output Analysis

In principle, data collected by EIA would appear to be of considerable use in constructing the input-output tables of the United States. These tables describe the flow of output between industries and, ultimately, to final demand (e.g., consumption, investment, export, and government purchases). Comprehensive energy data relating both to its production and disposition by end-use clearly could facilitate the construction of these tables. Additionally, a comprehensive and detailed energy data base, systematically updated, permits timely revision of the input-output tables.

Input-output analysis is useful in evaluating the effects of changes in the pattern of demand stemming from policy or from changes in market conditions on specific sectors of the economy. It traces these effects not only upon the sector producing the good or service immediately concerned, but also upon other sectors which supply it and which it supplies. One example of its use was the analysis of President Reagan's order to decontrol crude oil and petroleum product prices with regard to the changes in costs of production of various goods and services. 6/

The process of compiling the official input-output tables of the country's economy by the Bureau of Economic Analysis of the U.S. Department of Commerce occurs only after completion of the quinquennial economic census. This process takes several years; for example, the currently available tables are based on the data from the 1972 economic census and were not published until 1979. Revisions to the input-output tables based upon the 1977 economic census will

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6/ Prepared by Congressional Research Service for the U.S. House of Representatives. Committee on Energy and Commerce. Subcommittee on Oversight and Investigations. Committee Print 97-R; Selected Economic Effects of the January 1981 Decontrol of Domestic Crude Oil Prices: An Input-Output Analysis. July 1981.

not be available for some time, perhaps several years. These tables identify the distribution of outputs of 496 industries to each other and to final demand demand sectors (e.g., personal consumption).

Many of the EIA data bases lend themselves to use in the construction of these tables. These data bases furnish information for energy production sectors, and several collect information relating to energy use in industry and in final demand sectors. The fact that the input-output tables are based on annual data means that the several annual surveys undertaken by EIA can be used directly, rather than indirectly for revising, updating, and validating data from more frequent data collection forms. The data collection forms which lend themselves to this use are identified in Table 2.

One example of the potential use of EIA data for constructing input-output tables concerns the electric utility sector. This sector purchased inputs in 1972 from 111 industries (including itself). More than 72 percent of these inputs were purchased from five sectors: coal (19.65 percent), electric utility maintenance and repair (10.33 percent), petroleum refining and related products (11.29 percent), electric utilities (21.65 percent), and natural gas utilities (9.65 percent). 7/

At least 10 EIA data collection forms could be employed to provide these data inputs to the national input-output tables for the electric utility sector. Another form provides energy data for the personal consumption element of the final demand sector. As in the case of NIPA, the data from some of these forms would have to be combined with forms collecting data from natural gas producers, pipelines, and distributors of monthly and projected deliveries of natural gas to customers by end-use classifications. Form FPC-423 furnishes cost data for

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7/ U.S. Department of Commerce. Bureau of Economic Analysis. The Detailed Input-Output Structure of the U.S. Economy: 1972. Volume I: The Use and Make of Commodities by Industries. Table 1.

Table 2. Data Collected by Energy Information Administration (EIA) of Potential Use in Constructing Official U.S. Input-Output Tables

EIA Form and Title	
CE-189P:	Energy Efficiency Improvement & Recovered Materials Utilization Program-Plant Reporting Form
EIA-SG-1:	Survey of Gallonage Sales of Gasoline
EIA-SG-2:	Survey of Gallonage Sales of Gasoline
EIA-SG-4:	Survey of Gallonage Sales of Gasonline
EIA-3:	Quarterly Coal Consumption Report-Manufacturing Plants
EIA-5A:	Coke Plant Report-Annual Supplement
EIA-6:	Coal Distribution Report
EIA-7A:	Coal Production Report
EIA-28:	Energy Company Financial Reporting System
EIA-50:	Alternative Fuel Demand Due to National Gas Curtailments
EIA-64A:	Annual Report of the Origin of Natural Gas Liquids
EIA-87:	Refinery Report
EIA-88:	Bulk Terminal Stocks Report
EIA-89:	Pipeline Product Report
EIA-172:	Fuel Oil and Kerosene Sales
EIA-174:	Sales of Liquified Petroleum Gases
EIA-176:	Supply and Disposition of Natural Gas-Distributors
EIA-177:	Capacity of Petroleum Refineries
EIA-191:	Underground Natural Gas Storage Report
EIA-194:	Incremental Pricing Report
EIA-213:	Annual Retail Bills for Electric Utilities
EIA-456A:	Crude Oil Ownership Report
EIA-457B:	Residential Energy Consumption Survey-Household Questionnaire
EIA-457C:	Residential Energy Consumption Survey-Rental Agents

Table 2. Data Collected by Energy Information Administration (EIA) of Potential Use in Constructing Official U.S. Input-Output Tables-continued

EIA Form and Title	
EIA-457D:	Residential Energy Consumption Survey-Quarterly Survey of Fuel Oil Households
EIA-457E:	Residential Energy Consumption Survey-Electrical Utilities
EIA-457F:	Residential Energy Consumption Survey-Natural Gas Suppliers
EIA-457G:	Residential Energy Consumption Survey-Fuel Oil Supplier Form
EIA-457H:	Residential Energy Consumption Survey-Liquid Petroleum Gas Suppliers
EIA-627:	Annual Quantity and Value of Natural Gas Production
ERA-51:	Transfer Pricing Report
ERA-60:	Report of Oil Imports into the United States and Puerto Rico
ERA-182:	Domestic Crude Oil First Purchaser's Report
FERC-1-F:	Annual Report for Public Utilities (Class C & D)
FERC-2:	Annual Report for Natural Gas Companies (Class A & B)
FERC-2A:	Annual Report for Natural Gas Companies (Class C & D)
FERC-15:	Annual Report of Gas Upply for Certain Natural Gas Pipelines
FERC-16:	Report of Gas Supply and Requirements
FERC-122:	Report of First Sales of Natural Gas Under Sec. 109 Natural Gas Policy Act, Other Categories of Natural Gas
FERC-123:	Initial Report of 1st Sale of Natural Gas Under Sec. 105 Natural Gas Policy Act, Existing Interstate Contracts
FERC-124:	Report of 1st Sales of Natural Gas Under Sec. 106(B) Natural Gas Policy Act, Intrastate Rollover Contracts
FPC-1:	Annual Report for Electric Utilities, Licenses and Others (Class A & B)
FPC-12:	Power System Statement
FPC-14:	Annual Report for Imposters and Exporters of Natural Gas
FPC-423:	Monthly Report of Cost & Quality of Fuels for Electric Plants

Table 2. Data Collected by Energy Information Administration (EIA) of Potential Use in Constructing Official U.S. Input-Output Tables-continued

EIA Form and Title	
ICC-ACV-8:	Cost Data for Equipment and Tasks
ICC-ACV-9:	Cost Data for Pipeline Construction
ICC-P:	Annual Report-Carriers by Pipeline
NE-491A:	Survey of Uranium Marketing Activities
NE-491B:	Survey of U.S. Uranium Prices and Procurement

Source: Energy Information Administration. Directory of Energy Data Collection Forms. March 1982.

electric utilities on a monthly basis. Repair and maintenance inputs can be derived from Forms FERC-1-F, FERC 2, and FERC-2A. Form EIA-457E, the Residential Energy Consumption Survey-Electric Utilities, supplies data for the personal consumption element of the tables.

Several forms provide data on energy use by industrial plants. The annual reports on energy efficiency improvement and recovered material utilization programs at the plant level collect annual data from nearly 14,500 manufacturing plants on energy consumption by quantity and fuel type. The quarterly coal consumption report from 700 manufacturing plants along with the coke plant reports furnish detailed information for coal and coke products. These data, when combined with price data, enable one to determine other elements of the input-output tables.

Just as several forms identified as of potential use for NIPA appear to collect identical data elements, so do the forms indicated here as sources of data for the national input-output tables. This overlapping and/or duplication furnishes EIA the capability to validate data and to make revisions in them.

The existence of a time series of comprehensive and relevant data for the energy sector and, to some extent, for energy use in other sectors, creates the opportunity for timely updating of the input-output tables. As indicated previously, the official input-output tables of the U.S. economy are revised only after the completion of the economic census every five years, and are not released for some time thereafter. The assumption is made that the technical relationships between input and output remain constant. Over the past ten years, however, the changing situation regarding energy use and prices in industry has been so great as to cast much doubt upon the validity of this assumption. Note, for example, that the currently available official input-output tables describe technical relationships in 1972, prior to the 1973-74 surge in crude oil prices. Even the 1977 tables, when they are released, will not treat fully the surge in oil prices in 1979 and the gradual decontrol of natural

gas prices in and after 1978. The ability to revise the input-output tables at least with respect to energy inputs and outputs is enhanced by the availability of the EIA data bases. 8/

III. The Reduction and Modification of Data Bases Maintained by EIA

At least nine of the 102 data collection forms used by EIA have been or will be scheduled to be eliminated or modified. EIA contends that the elimination or modification of these forms is justified by the expiration of the legislative authority to collect these data and/or the regulatory functions for which they are necessary. These forms are identified in Table 3.

Only the elimination of EIA Form 460: Petroleum Product Monthly Report for Product Prices could have serious consequences for the use of EIA data in constructing NIPA. This form collects both volume and price data for seven categories of petroleum and natural gas products, including imports. Its use will be discontinued one year after the expiration of the Emergency Petroleum Allocation Act of 1973. It is the one form which gathers information on price for a wide variety of energy products.

Of the other four forms to be eliminated, none directly affects the ability of EIA to collect data useful for NIPA. The three forms of gasoline gallonage sales which could assist in compiling data on personal expenditures for gasoline can only be used indirectly, because they do not identify the end-users by class (i.e., households, industrial, commercial). Also, one of these forms collects only annual

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8/ The U.S. Department of Commerce Bureau of Economic Analysis (BEA) recognizes this issue, and has made updates of the official input-output tables for the years 1973-1975 to reflect changing energy prices. These updates, produced in the form of staff working papers, are at the 85-industry level of detail, rather than at the 496-industry level. Also, the updates have been made using mathematical procedures, rather than being based upon economic census data. The Bureau is currently preparing updated tables for the years 1976-1979. Thus, although efforts have been made to deal with changes in energy prices and usage since 1972, the revisions may lack the precision and statistical reliability of the official input-output tables at the 496-industry level of detail.

Table 3. Energy Information Administration Data Forms Scheduled for Elimination or Modification

EIA Form and Title		Elimination	Modification
EIA-SG-1:	Survey of Gallonage Sales of Gasoline	x	
EIA-SG-2:	Survey of Gallonage Sales of Gasoline	x	
EIA-SG-4:	Survey of Gallonage Sales of Gasoline	x	
EIA-14:	Refiners Monthly Cost Report		x
EIA-25:	Prime Supplier's Monthly Report		x
EIA-28:	Energy Company Financial Reporting System	x	
EIA-460:	Petroleum Product Monthly Report for Product Prices	x	
ERA-51:	Transfer Pricing Report		x
ERA-182:	Domestic Crude Oil First Purchaser's Report		x

SourceS: Energy Information Administration, Directory of Energy Data Collection Forms. March 1982. Department of Energy. Fiscal Year 1983 Congressional Budget Request. Volume 7.

data, and therefore, could be of use for only annual revisions in NIPA and for data validation purposes. The fifth form scheduled to be eliminated is EIA-28: Energy Company Financial Reporting System. This form is submitted annually and, therefore, would be of little or no usefulness in compiling NIPA, which is published quarterly.

Form EIA-141: National Survey of Fuel Purchases for Vehicles--Purchase Log and Supplementary Questionaire collects monthly from 6,000 private individuals quantity and value data on gasoline sales. It provides, therefore, a basis for developing NIPA estimates of personal consumption expenditures. There are, however, no other forms used by EIA which permit data validation functions or revisions to be performed.

With respect to the implications of elimination of forms for use in constructing the national input-output tables, only forms EIA-28 and EIA-460 appear to provide potentially useful information. The elimination of Form EIA-28, the Energy Company Financial Reporting System, will be discussed in the next section. The elimination of Form EIA-460 means that no consistent price data will be available to estimate the value of industrial use of energy inputs.

The modifications made in some forms would not appear to affect seriously EIA's ability to furnish data to construct NIPA or the U.S. input-output tables. The modifications terminate collection of data formerly collected in connection with energy price controls and the allocation of petroleum products among regions during supply emergencies, authority for which has expired. Parenthetically, it it may be noted that modification of at least one form, ERA-182: Domestic Crude Oil First Purchaser's Report, increases the difficulty in estimating government revenues from the crude oil windfall profit tax, because it no longer collects data by category of crude oil. To this extent, therefore, the accuracy of NIPA estimates is reduced; the revenues involved are relatively small in relation to the total budget, being in the range of $10-$25 billion.

IV. The Financial Reporting System (FRS)

The elimination of the Financial Reporting System (FRS) and its associated data collection form, EIA-28, could represent a loss of data of use in constructing the national input-output tables. In addition, unless replaced by some alternative, its loss raises questions as to EIA's ability to fulfill the requirements of its mandate under the law with respect to annual reporting on the financial status and competitive structure of the energy industry.

The FRS was established pursuant to Section 205(h) of the Department of Energy Organization Act. This section requires EIA to file an annual report to Congress, and, if deemed advisable by the Administrator, a quarterly report on the financial aspects of energy company operations, the competitive structure of the industry, its foreign and domestic energy activities, and the costs associated with energy-related lines of business, including exploration, development, production, processing, and distribution. The report is to present "a statistically accurate profile of each line of commerce in the energy industry," and, "shall be designed to allow comparison on a uniform and standardized basis among energy-producing companies...." 9/

EIA has collected the required data from 27 crude oil, natural gas, and coal producing companies, each of which accounts for at least one percent of domestic production, reserves, refinery capacity, or sales. 10/ The data are processed in EIA's data management system: 6440 - Financial Reporting System. The required report is published as document DOE/EIA-0206: Performance Profiles of Major Energy Producers. To date, annual reports have been published for the years 1977, 1978, 1979, and 1980. EIA is currently preparing a report in this series covering the period 1974 to 1980. Although it has received

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9/ Public Law 95-91. Section 205(h).

10/ Energy Information Administration. U.S. Department of Energy. Directory of Energy Collection Forms. March, 1982, p. 4.

clearance from the Office of Management and Budget to collect 1981 data on Form EIA-28, EIA has not announced a publication date for the 1981 annual report.

The financial reporting system enables company financial data to be disaggregated to specific energy types. Although all companies are required to provide business segment financial data in submissions to the Securities and Exchange Commission, there is some latitude accorded the companies in interpreting what activity constitutes a specific line of business. For example, mining can include the extraction of both energy and non-energy minerals. EIA contends that it can present in a consistent manner financial profiles of major energy companies and their energy activities by requiring submission of data specific to energy and other business segments. Also, FRS provides the only official public aggregation of this information.

FRS could provide data for constructing the national input-output tables. With its specific information on energy activities and lines of business, flows of petroleum and natural gas to pipelines to refineries can be traced. In addition, new construction of petroleum pipelines can be identified along with drilling and exploration sectors of the input-output tables.

The concern that similar data can be obtained from other sources than EIA is often expressed. The American Petroleum Institute (API), for example, publishes reports from time to time on financial data of U.S. oil companies. A recent API report issued in October 1981 discussed company profits and other balance sheet entries based solely upon company annual reports and filings with the Securities Exchange Commission. 11/ This API report and FRS use the same basic data; however, FRS, by requiring submission of more detailed information on

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11/ N. Gal and C. Pendzich. Key Financial Data of Leading U.S. Oil Companies 1968-1980. Discussion Paper # 017R. American Petroleum Institute. October 28, 1981.

energy activity, claims to be able to achieve a firmer basis for comparison, and to "fine tune" its analysis of energy company activity.

V. Users of EIA Data for Economic Analysis: Some Concluding Observations

This report has focused on the potential uses of EIA data in compiling NIPA and official U.S. input-output tables. Not considered in this report is the fact that some of EIA's data bases are collected for other agencies of government concerned, in part, with economic analysis. In addition, private sector economic analysis makes extensive use of EIA data bases. Finally, recognition must be given to the EIA's primary function, which is to collect data for and to provide analysis of the country's energy situation; therefore, although economic analysis is a function for which EIA data can be used, it is by no means the principal mission of EIA.

(a) Government Users of EIA Data

EIA data are collected for and employed by several government departments and agencies concerned with economic analysis. The Department of Energy utilizes EIA data bases in fulfilling its legislative mandate to assess energy-economy interactions. 12/ This function is performed by the Department of Energy independently of EIA. A number of data bases are maintained specifically for other departments of government. For example, Form EIA-101 (Monthly Residential, Commercial, and Industrial Electric Bill Data for the U.S. Bureau of Labor Statistics--Price Indexes) is used for computing the Consumer and Producer Price Indexes. The Bureau of Census utilizes data from Form EIA-5: Coke Plant Report, and from Form FPC-423: Monthly Report of Cost and Quality of Fuels for Electric Plants to compile more comprehensive data on business conditions. The latter form, FPC-423, processes data for the Departments of Commerce and Labor, the Federal Reserve Board and the Council of Economic Advisers, among others.

12/ U.S. Department of Energy. Office of Policy, Planning and Analysis. Interelationships of Energy and the Economy. July 1981.

(b) Private Sector Users of EIA Data for Economic Analysis

Firms maintaining commercial economic models use EIA data bases, among others, in monitoring economic activity. These firms use these data bases for other purposes as well, and maintain in their computers literally tens of thousands of historical series on energy, only a few of which are used in their models of the economy. Among these services are Chase Econometrics, and Data Resources, Incorporated.

The macroeconomic models of both of these services include energy submodels. The DRI model, for example, contains equations relating to fuel costs and implicit price deflators of energy components of GNP. These data are obtained directly or indirectly from EIA. Refinery cost data are obtained directly from EIA; implicit price deflators, which are constructed using consumer and producer price indexes are obtained indirectly from Form EIA-101 and others.

(c) Multiple Uses of EIA Data: Conclusion

This report attempts to bring into perspective the role of EIA in furnishing data for economic analysis. This function is one of many played by EIA and, in fact, may be a relatively minor one vis-a-vis its role in energy analysis. As previously observed, its main function is to be the central source within the government for collecting, analyzing, and disseminating energy data and information for energy analysis and policy development. The examination of the data bases maintained by EIA indicates that EIA does, in fact, collect much data which could facilitate economic analysis, in addition to other uses in both the public and private sectors. The information management systems developed by EIA are designed, however, to provide information mainly for energy analysis. To improve EIA's ability to furnish data for economic analysis, it would appear necessary for it develop new or modify its existing information management systems to extract and compile data for this purpose.

APPENDIX I

DATA COLLECTION FORMS GROUPED BY ENERGY SOURCE AND FUNCTION

	Form No.	Form Title
Energy sources (all)		
Production	EIA-28	Energy Company Financial Reporting System
Supply	EIA-50	Alternative Fuel Demand Due To Natural Gas Curtailments
	FPC-423	Monthly Report of Cost and Quality of Fuels for Electric Plants
Disposition	EIA-28	Energy Company Financial Reporting System
Demand	EIA-50	Alternative Fuel Demand Due To Natural Gas Curtailments
Consumption	CE-189C	Energy Efficiency Improvement & Recovered Materials Utilization Program-Corporate Reporting Form
	CE-189P	Energy Efficiency Improvement & Recovered Materials Utilization Program-Plant Reporting Form
	CE-189S	Energy Efficiency Improvement & Recovered Materials Utilization Program-Sponsor Reporting Form
	EIA-457B	Residential Energy Consumption Survey - Household Questionnaire
	EIA-457C	Residential Energy Consumption Survey - Rental Agents
	EIA-457D	Residential Energy Consumption Survey - Quarterly Survey of Fuel Oil Households
	FPC-67	Steam - Electric Plant Air and Water Quality Control Data
Conservation	CE-189C	Energy Efficiency Improvement & Recovered Materials Utilization Program-Corporate Reporting Form
	CE-189P	Energy Efficiency Improvement & Recovered Materials Utilization Program-Plant Reporting Form
	CE-189S	Energy Efficiency Improvement & Recovered Materials Utilization Program-Sponsor Reporting Form
	EIA-457D	Residential Energy Consumption Survey - Quarterly Survey of Fuel Oil Households
Support and administration	EIA-28	Energy Company Financial Reporting System
Unspecified sources		
Support and administration	EIA-459	Uniform Reporting System for Federal Assistance (Grants & Cooperative Agreements)
Petroleum		
Recovery	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
	ERA-424D	Tertiary Incentive Annual Report of Prepaid Expenses
Reserves	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
Processing	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-161	Weekly Refinery Report
	EIA-177	Capacity of Petroleum Refineries
Supply	EIA-14	Refiner's Monthly Cost Report
	EIA-67	Foreign Crude Oil Cost Report
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-90	Crude Oil Stocks Report
	EIA-142	International Energy Agency Emergency Supply Report
	EIA-164	Crude Oil Stocks Report
	EIA-165	Imports Report
	EIA-177	Capacity of Petroleum Refineries
	ERA-51	Transfer Pricing Report
	ERA-60	Report of Oil Imports into the United States and Puerto Rico
	ERA-182	Domestic Crude Oil First Purchaser's Report
	ICC-P	Annual Report - Carriers By Pipeline
Disposition	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
	EIA-67	Foreign Crude Oil Cost Report
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-170	Tanker and Barge Shipments of Crude Oil and Petroleum Products
	ERA-51	Transfer Pricing Report
	ICC-P	Annual Report - Carriers By Pipeline
Movement	EIA-170	Tanker and Barge Shipments of Crude Oil and Petroleum Products
	ICC-P	Annual Report - Carriers By Pipeline

Petroleum products

FORMS BY ENERGY SOURCE AND FUNCTION

	Form No.	Form Title
Support and administration	ERA-182	Domestic Crude Oil First Purchaser's Report
	ERA-424D	Tertiary Incentive Annual Report of Prepaid Expenses
	ICC-ACV-5	Inventory of Property Other Than Land and Rights-Of-Way
	ICC-ACV-6	Inventory of Land and Rights-Of-Way
	ICC-ACV-7	Summary of Original Cost of Inventory
	ICC-ACV-8	Cost Data for Equipment and Tanks
	ICC-ACV-9	Cost Data for Pipeline Construction
	ICC-ACV-159	Service Life Data
	ICC-P	Annual Report - Carriers By Pipeline
Petroleum products		
Production	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-161	Weekly Refinery Report
	EIA-177	Capacity of Petroleum Refineries
Supply	EIA-SG-1	Survey of Gallonage Sales of Gasoline
	EIA-14	Refiner's Monthly Cost Report
	EIA-25	Prime Supplier's Monthly Report
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-88	Bulk Terminal Stocks Report
	EIA-141	National Survey of Fuel Purchasesfor Vehicles - Purchase Log and Supplementary Questionnaire
	EIA-142	International Energy Agency Emergency Supply Report
	EIA-161	Weekly Refinery Report
	EIA-162	Weekly Bulk Terminal Stocks of Finished Products
	EIA-163	Weekly Pipeline Stocks of Finished Products
	EIA-165	Imports Report
	EIA-177	Capacity of Petroleum Refineries
	EIA-460	Petroleum Product Monthly Report for Product Prices
	EIA-759	Monthly Powerplant Report
	ERA-60	Report of Oil Imports into the United States and Puerto Rico
	ICC-P	Annual Report - Carriers By Pipeline
Disposition	EIA-SG-1	Survey of Gallonage Sales of Gasoline
	EIA-SG-2	Survey of Gallonage Sales of Gasoline
	EIA-SG-4	Survey of Gallonage Sales of Gasoline
	EIA-9A	No. 2 Distillate Price Monitoring Report
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-170	Tanker and Barge Shipments of Crude Oil and Petroleum Products
	EIA-172	Fuel Oil and Kerosene Sales
	EIA-194	Incremental Pricing Report
	EIA-460	Petroleum Product Monthly Report for Product Prices
	ICC-P	Annual Report - Carriers By Pipeline
Consumption	EIA-429	National Survey of Fuel Purchases For Vehicles Background Questionnaire
	EIA-457D	Residential Energy Consumption Survey - Quarterly Survey of Fuel Oil Households
	EIA-457G	Residential Energy Consumption Survey-Fuel Oil Supplier Form
	EIA-457H	Residential Energy Consumption Survey-Liquid Petroleum Gas Suppliers
	EIA-759	Monthly Powerplant Report
	ERA-316	Petition for Temporary Use of Natural Gas
Movement	EIA-89	Pipeline Products Report
	EIA-170	Tanker and Barge Shipments of Crude Oil and Petroleum Products
	IGC-P	Annual Report - Carriers By Pipeline
Support and administration	ICC-ACV-5	Inventory of Property Other Than Land and Rights-Of-Way
	ICC-ACV-6	Inventory of Land and Rights-Of-Way
	ICC-ACV-7	Summary of Original Cost of Inventory
	ICC-ACV-8	Cost Data for Equipment and Tanks
	ICC-ACV-9	Cost Data for Pipeline Construction
	ICC-ACV-159	Service Life Data
	ICC-F	Annual Report - Carriers By Pipeline
Natural gas		
Recovery	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
	FERC-15	Annual Report ofGas SupplyforCertain Natural Gas Pipelines
Reserves	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
	FERC-15	Annual Report ofGas SupplyforCertain Natural Gas Pipelines
	FPC-334	Reserve Dedication Report
Processing	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
Production	EIA-627	Annual Quantity and value of Natural Gas Production
Supply	EIA-50	Alternative Fuel Demand Due To Natural Gas Curtailments

	Form No.	Form Title
	EIA-64	Natural Gas Liquids Operations Report
	EIA-64A	Annual Report of the Origin of Natural Gas Liquids - Production
	EIA-81	Gaseous Fuels Emergency Telephone Survey
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-176	Supply and Disposition of Natural Gas - Distributors
	EIA-191	Underground Natural Gas Storage Report
	ERA-400	Survey of Surplus Natural Gas Supplies
	FERC-15	Annual Report ofGas SupplyforCertain Natural Gas Pipelines
	FERC-16	Report of Gas Supply and Requirements
	FPC-8	Underground Gas Storage Report
	FPC-14	Annual Report for Importers and Exporters of Natural Gas
Disposition	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
	EIA-50	Alternative Fuel Demand Due To Natural Gas Curtailments
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-174	Sales of Liquefied Petroleum Gases
	EIA-176	Supply and Disposition of Natural Gas - Distributors
	EIA-460	Petroleum Product Monthly Report for Product Prices
	FERC-11	Natural Gas Pipeline Monthly Report
	FERC-16	Report of Gas Supply and Requirements
	FERC-122	Rept. of 1st Sales of Nat. Gas Under Sec 109, Nat. Gas Policy Act, Other Categories of Nat. Gas
	FERC-123	Initial Rept. of 1st Sale of Nat. Gas Under Sec 105 Nat Gas Policy Act, Existing Interstate Contract
	FERC-124	Rept of 1st Sales of Nat. Gas Under Sec 106(B), Nat. Gas Policy Act, Intrastate Rollover Contracts
	FPC-14	Annual Report for Importers and Exporters of Natural Gas
Demand	FERC-16	Report of Gas Supply and Requirements
Consumption	EIA-457F	Residential Energy Consumption Survey - Natural Gas Suppliers
	EIA-457H	Residential Energy Consumption Survey-Liquid Petroleum Gas Suppliers
Movement	EIA-64	Natural Gas Liquids Operations Report
	EIA-64A	Annual Report of the Origin of Natural Gas Liquids - Production
	EIA-89	Pipeline Products Report
	EIA-176	Supply and Disposition of Natural Gas - Distributors
Support and administration	EIA-457F	Residential Energy Consumption Survey - Natural Gas Suppliers
	EIA-758	Natural Gas Producer/Pipeline Contracts Survey
	ERA-166	Public Utility Regulatory Policies Act (PURPA) Annual Report on Electric and Gas Utilities
	FERC-2	Annual Report for Natural Gas Companies (Class A & B)
	FERC-2A	Annual Report For Natural Gas Companies (Class C & D)
	FERC-11	Natural Gas Pipeline Monthly Report
Regulatory functions	ERA-316	Petition for Temporary Use of Natural Gas
	FERC-122	Rept. of 1st Sales of Nat. Gas Under Sec 109, Nat. Gas Policy Act, Other Categories of Nat. Gas
	FERC-124	Rept of 1st Sales of Nat. Gas Under Sec 106(B), Nat. Gas Policy Act, Intrastate Rollover Contracts
	FPC-314A	Application for Small Producer Exemption
Natural gas products		
Recovery	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
Reserves	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
Processing	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-177	Capacity of Petroleum Refineries
Production	EIA-64	Natural Gas Liquids Operations Report
	EIA-64A	Annual Report of the Origin of Natural Gas Liquids - Production
Supply	EIA-50	Alternative Fuel Demand Due To Natural Gas Curtailments
	EIA-64	Natural Gas Liquids Operations Report
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-142	International Energy Agency Emergency Supply Report
	FERC-15	Annual Report ofGas SupplyforCertain Natural Gas Pipelines
Disposition	EIA-23	Annual Survey of Domestic Oil and Gas Reserves
	EIA-50	Alternative Fuel Demand Due To Natural Gas Curtailments
	EIA-64	Natural Gas Liquids Operations Report
	EIA-87	Refinery Report
	EIA-87R	Refinery Report Supplement
	EIA-174	Sales of Liquefied Petroleum Gases
	EIA-460	Petroleum Product Monthly Report for Product Prices
Movement	EIA-89	Pipeline Products Report

FORMS BY ENERGY SOURCE AND FUNCTION

	Form No.	Form Title
Coal		
Mining	EIA-5	Coke Plant Report - Quarterly
	EIA-6	Coal Distribution Report
	EIA-7A	Coal Production Report
Processing	EIA-5	Coke Plant Report - Quarterly
	EIA-5A	Coke Plant Report - Annual Supplement
Supply	EIA-1	General Industries and Blast Furnaces Weekly Coal Monitoring Report
	EIA-3	Quarterly Coal Consumption Report - Manufacturing Plants
	EIA-4	Weekly Coal Monitoring Report - Coke Plants
	EIA-5A	Coke Plant Report - Annual Supplement
	EIA-6	Coal Distribution Report
	EIA-7A	Coal Production Report
	EIA-20	Weekly Telephone Questionnaire For Coal Burning Electric Utilities
	EIA-759	Monthly Powerplant Report
Disposition	EIA-6	Coal Distribution Report
	EIA-7A	Coal Production Report
Consumption	EIA-3	Quarterly Coal Consumption Report - Manufacturing Plants
	EIA-97	
	EIA-759	Monthly Powerplant Report
	ERA-316	Petition for Temporary Use of Natural Gas
Movement	EIA-6	Coal Distribution Report
Electricity		
Generation	EIA-254	QUARTERLY PROGRESS REPORT ON STATUS OF REACTOR CONSTRUCTION
	EIA-759	Monthly Powerplant Report
	EP-411	Coordinated Regional Bulk Power Supply Program Report
	ERA-316	Petition for Temporary Use of Natural Gas
	FPC-1	Annual Report for Electric Utilities, Licensees and Others (Class A & B)
	FPC-12	Power System Statement
Supply	EP-411	Coordinated Regional Bulk Power Supply Program Report
	EP-417	Power System Emergency Report
	FPC-12	Power System Statement
Disposition	FERC-5	Electric Utility Company Monthly Statement
	FPC-12	Power System Statement
Demand	EP-411	Coordinated Regional Bulk Power Supply Program Report
	FPC-12	Power System Statement
Consumption	EIA-429	National Survey of Fuel Purchases For Vehicles Background Questionnaire
	EIA-457E	Residential Energy Consumption Survey - Electric Utilities
Support and administration	EIA-97	
	EIA-101	Monthly Residential, Commercial, and Industrial Electric Bill Data for the U.S. Bureau of Labor Statistics—Price Indexes
	EIA-213	Annual Retail Bills For Electric Utilities
	EIA-457E	Residential Energy Consumption Survey - Electric Utilities
	EP-411	Coordinated Regional Bulk Power Supply Program Report
	EP-417	Power System Emergency Report
	ERA-166	Public Utility Regulatory Policies Act (PURPA) Annual Report on Electric and Gas Utilities
	FERC-1-F	Annual Report For Public Utilities (Class C & D)
	FERC-5	Electric Utility Company Monthly Statement
	FPC-1	Annual Report for Electric Utilities, Licensees and Others (Class A & B)
	FPC-1	Annual Report for Electric Utilities, Licensees and Others (Class A & B)
	FPC-12	Power System Statement
	FPC-423	Monthly Report of Cost and Quality of Fuels for Electric Plants
Regulatory functions	FPC-12	Power System Statement
Nuclear energy		
Production	NE-491A	Survey of Uranium Marketing Activities
Solar		
Support and administration	EIA-63	Solar Collector Manufacturing Survey
Wind		
Collection	EIA-68	Wind Energy Conversion Systems Sales Survey
Support and administration	EIA-68	Wind Energy Conversion Systems Sales Survey
Synthetic fuels		
Supply	FERC-15	Annual Report ofGas SupplyforCertain Natural Gas Pipelines

Source: Energy Information Administration. Directory of Energy Data Collection Forms, March 1982.

APPENDIX II

DATA COLLECTION FORMS LINKED to SYSTEMS AND PUBLICATIONS

SYSTEMS AND ASSOCIATED FORMS

3142 Coal Consumption at Manufacturing Plants
- EIA-3 — Quarterly Coal Consumption Report - Manufacturing Plants

3143 Coke and Coal Chemical Materials System
- EIA-5 — Coke Plant Report - Quarterly
- EIA-5A — Coke Plant Report - Annual Supplement

3144 Bituminous Coal and Lignite Distribution
- EIA-6 — Coal Distribution Report

3145 Bituminous Coal and Lignite Production & Mine Operation
- EIA-7A — Coal Production Report

3221 Powerplant Reporting System
- EIA-759 — Monthly Powerplant Report

3222 Cost and Quality of Fuels for Electric Generating Plants
- FPC-423 — Monthly Report of Cost and Quality of Fuels for Electric Plants

3223 Generating Unit Reference File (Inventory of Power Plants)
- FPC-12 — Power System Statement
- FPC-67 — Steam - Electric Plant Air and Water Quality Control Data

3243 (2) Typical Monthly Electric Bills
- EIA-213 — Annual Retail Bills For Electric Utilities

3246 Power System Statements
- FPC-12 — Power System Statement

3248 Steam Electric Plant Air and Water Quality Control Data
- FPC-67 — Steam - Electric Plant Air and Water Quality Control Data

3249 Electric Power Constructions
- FPC-1 — Annual Report for Electric Utilities, Licensees and Others (Class A & B)

3249 (1) Power Line Construction Data
- FPC-12 — Power System Statement

6002 Weekly Petroleum Status Reporting System
- EIA-161 — Weekly Refinery Report
- EIA-162 — Weekly Bulk Terminal Stocks of Finished Products
- EIA-163 — Weekly Pipeline Stocks of Finished Products
- EIA-164 — Crude Oil Stocks Report
- EIA-165 — Imports Report

6032 Prime Supplier's Reporting System (Subpart L Syst.)
- EIA-25 — Prime Supplier's Monthly Report

6038 Market Shares Monitoring System
- EIA-SG-1 — Survey of Gallonage Sales of Gasoline
- EIA-SG-2 — Survey of Gallonage Sales of Gasoline
- EIA-SG-4 — Survey of Gallonage Sales of Gasoline

6040 (3) Project Electric Generating Capacity System
- EP-411 — Coordinated Regional Bulk Power Supply Program Report

6047 Transfer Pricing System
- ERA-51 — Transfer Pricing Report

6055 Oil and Gas Information System
- EIA-23 — Annual Survey of Domestic Oil and Gas Reserves

6065 (1) Foreign Crude Oil Cost System
- EIA-67 — Foreign Crude Oil Cost Report

6065 (2) International Energy Agency Emergency Reporting System
- EIA-142 — International Energy Agency Emergency Supply Report

6105 Refiner's Cost Allocation Reporting System (Refinery Cost Pass Through)
- EIA-14 — Refiner's Monthly Cost Report

6107 Crude Oil Ownership Reporting System
- EIA-456A — Crude Oil Ownership Report

SYSTEMS AND ASSOCIATED FORMS

6233 Petroleum Industry Product Price Reporting System (Cost and Pricing Syst.)
- EIA-460 — Petroleum Product Monthly Report for Product Prices

6253 (1) Oil Import System
- ERA-60 — Report of Oil Imports into the United States and Puerto Rico

6272 Crude Oil First Purchase
- ERA-182 — Domestic Crude Oil First Purchaser's Report

6301 (1) Capacity of Petroleum Refineries
- EIA-177 — Capacity of Petroleum Refineries

6301 (2) Petroleum Reporting System
- EIA-87 — Refinery Report
- EIA-88 — Bulk Terminal Stocks Report
- EIA-89 — Pipeline Products Report
- EIA-90 — Crude Oil Stocks Report

6322 Powerplant Exemption System
- ERA-316 — Petition for Temporary Use of Natural Gas

6411 Underground Gas Storage
- EIA-191 — Underground Natural Gas Storage Report
- FPC-8 — Underground Gas Storage Report

6440 Financial Reporting System
- EIA-28 — Energy Company Financial Reporting System

6477 Energy Emergency Management Information System
- EIA-81 — Gaseous Fuels Emergency Telephone Survey

6517 Natural Gas Processing Plant Operations
- EIA-64 — Natural Gas Liquids Operations Report

6534 Data on Receipts, Consumption and Stocks at Electric Utilities
- EIA-759 — Monthly Powerplant Report

6536 Fuel Oil and Kerosene Sales and Inventories
- EIA-172 — Fuel Oil and Kerosene Sales

6539 Natural Gas Liquids Operations Reporting System
- EIA-64 — Natural Gas Liquids Operations Report

6542 Sales of Liquefied Petroleum Gases
- EIA-174 — Sales of Liquefied Petroleum Gases

6543 Natural Gas Supply and Disposition
- EIA-176 — Supply and Disposition of Natural Gas - Distributors

6544 Tanker and Barge Shipments of Crude Oil and Petroleum Products Between P.A.D. Districts
- EIA-170 — Tanker and Barge Shipments of Crude Oil and Petroleum Products

6551 (1) Solar Collector Manufacturers and Importers Data System
- EIA-63 — Solar Collector Manufacturing Survey

6569 Natural Gas Supplies of Interstate Natural Gas Pipeline Companies
- FERC-15 — Annual Report of Gas Supply for Certain Natural Gas Pipelines

6589 Natural Gas Interstate Pipeline Supply & Requirements Reporting System
- FERC-16 — Report of Gas Supply and Requirements

6593 Natural Gas Importers and Exporters Reporting System
- FPC-14 — Annual Report for Importers and Exporters of Natural Gas

6615 (3) Fuel Purchases for Vehicles
- EIA-141 — National Survey of Fuel Purchases for Vehicles - Purchase Log and Supplementary Questionnaire
- EIA-429 — National Survey of Fuel Purchases For Vehicles Background Questionnaire

6615 (4) Residential Energy Consumption
- EIA-457B — Residential Energy Consumption Survey - Household Questionnaire
- EIA-457C — Residential Energy Consumption Survey - Rental Agents
- EIA-457D — Residential Energy Consumption Survey - Quarterly Survey of Fuel Oil Households
- EIA-457E — Residential Energy Consumption Survey - Electric Utilities
- EIA-457F — Residential Energy Consumption Survey - Natural Gas Suppliers
- EIA-457G — Residential Energy Consumption Survey - Fuel Oil Supplier Form
- EIA-457H — Residential Energy Consumption Survey - Liquid Petroleum Gas Suppliers

6743 No. 2 Distillate Price Monitoring System
- EIA-9A — No. 2 Distillate Price Monitoring Report

8005 Alternate Fuel/Incremental Natural Gas Price Monitoring System
- EIA-194 — Incremental Pricing Report

8071 Alternate Fuel Demand Due to Natural Gas Curtailments System
- EIA-50 — Alternative Fuel Demand Due To Natural Gas Curtailments

8678 First Sales of Natural Gas
- FERC-122 — Report of First Sales of Natural Gas Under Sec. 109, Natural Gas Policy Act, Other Categories of Natural Gas
- FERC-123 — Initial Rept. of 1st Sale of Nat. Gas Under Sec 105 Nat Gas Policy Act, Existing Interstate Contract

SYSTEMS AND ASSOCIATED FORMS

FERC-124	Rept of 1st Sales of Nat. Gas Under Sec 106(B), Nat. Gas Policy Act, Intrastate Rollover Contracts

8802 Utility Construction Data for the Census Bureau

FERC-5	Electric Utility Company Monthly Statement
FERC-11	Natural Gas Pipeline Monthly Report
FPC-1	Annual Report for Electric Utilities, Licensees and Others (Class A & B)

8842 (1) Captive and Independent Mine Productivity

EIA-7A	Coal Production Report

8842 (2) Interrogatory I Fuel Purchase System

FPC-423	Monthly Report of Cost and Quality of Fuels for Electric Plants

8921 Analysis of Electric Utility Depreciation Practices

FPC-1	Annual Report for Electric Utilities, Licensees and Others (Class A & B)

8922 (1) Pipeline Companies Annual Reporting System

ICC-P	Annual Report - Carriers By Pipeline

8922 (2) Electric Utilities and Licensees Reporting System (Class A & B)

FPC-1	Annual Report for Electric Utilities, Licensees and Others (Class A & B)

8922 (3) Natural Gas Pipeline Company Monthly Statements

FERC-11	Natural Gas Pipeline Monthly Report

8922 (4) Natural Gas Pipeline Company Annual Reporting System (Classes A & B)

FERC-2	Annual Report for Natural Gas Companies (Class A & B)

8922 (5) Electric Utility Operating Revenue and Income Statements

FERC-5	Electric Utility Company Monthly Statement

Source: Energy Information Administration. Directory of Energy Data Collection Forms, March 1982.

CHAPTER II

THE EFFECT OF PROPOSED BUDGET CUTS ON THE ENERGY INFORMATION ADMINISTRATION'S ANALYTICAL FUNCTION*

The Reagan Administration's proposed budget for FY1983 recommends significant reductions in the analytical capability of the Energy Information Administration (EIA). These reductions represent a reversal in budget priorities from the early years of EIA when analysis was a growing part of the EIA budget. To examine the potential impact of the proposed FY83 budget, this report is divided into five parts. The first section provides background on the creation and operation of the analytical function within EIA. The second section examines the organization of EIA's analytical function and the changes made by the Reagan Administration. The third section catalogues EIA's current analytical capability with the fourth section discussing the potential impact of the proposed budget cuts. Finally, the fifth section discusses the rationale behind the budget reductions.

Background

EIA was created within the Department of Energy to centralize energy data collection and analysis within one agency. Previous to EIA, data responsibilities were carried out by several different agencies, including the Federal Power Commission, the Bureau of Mines, and the Federal Energy Administration (FEA). This fragmentation was blamed for increasing the energy industry's paperwork burden and for contributing to a general lack of understanding about the energy problem. 1/

Among the functions EIA inherited were those of the FEA's Office of Energy Information and Analysis. The Congress had established this office

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* Prepared by Larry Parker, Analyst in Energy Policy, Environment and Natural Resources Policy Division.

1/ Professional Audit Review Team. Activities of the Energy Information Administration. May 7, 1979. p. 1. PART was created by P.L. 94-385 to independently evaluate the data collection, analysis and dissemination activities of FEA. With enactment of P.L. 95-91, EIA became subject to these annual evaluations.

in 1974 because it was dissatified with the energy information and analysis it was receiving. This lack of credible information and analysis was considered to be a major cause for the government's "inability" to deal with the energy problem. As stated by the Professional Audit Review Team (PART) in their first evaluation of EIA:

> ...The absence of credible energy data and analysis has not only hampered the Congress, the President, and the executive departments in intelligently evaluating the array of energy alternatives facing the U.S., but also it contributed to widespread public skepticism regarding the seriousness of the energy crisis. 2/

As noted by PART, FEA's office of Energy Information and Analysis had not been successful in providing objective and independent energy analysis. Indeed, PART felt that FEA's office operated as an extension of the energy policy and planning staff of the Executive Office of the President. To protect EIA from a similar problem, the Congress made EIA relatively independent and kept the responsibility for formulating and advocating national energy policy separate from EIA's data collection and analysis function. It was hoped that such a separation would promote the credibility of EIA's products.

EIA is given mandates under several laws to perform analyses of various energy situations. In particular, EIA is required to provide an annual report:

> ...which includes, but is not limited to ... short-, medium-, and long-term energy consumption and supply trends and forecasts under various assumptions; and to the maximum extent practicable, a summary or schedule of the amounts of mineral fuels resources, nonmineral energy resources, and mineral fuels that can be brought to market at various prices and technologies and their relationship to forecasted demands. 3/

2/ idem.

3/ Section 57 (a) (2), Federal Energy Administration Act of 1974, P.L. 93-275.

To fulfill their mandate for objective analysis and to avoid advocating policy, EIA analyses generally assume a continuation of current policies unless other conditions are specified by a client. As stated by Dr. Roger Glassey, former Assistant Administrator for Applied Analysis:

> In policy analysis we are to be unbiased and objective, then it seems we should not be involved in designing policies because it is difficult to be objective about a policy which you, yourself, have thought up. So we have refrained from speculating about what future policies might be. In particular, we have not undertaken analysis on our own initiative, in which we would specify policies which were not yet in place as some of the alternatives to be considered, because we felt by doing so we would be implicitly in the policy design and advocacy business. 4/

Such a perspective has brought mixed reviews. PART in its evaluation of EIA's 1979 and 1980 Annual Reports stated:

> Based on our review, the forecast volumes of the 1979 and 1980 Annual Reports are balanced and objective presentations of the types of information needed for decisionmaking. They offer qualified predictions of what is likely to happen under certain assumptions or premises and clearly state that the accuracy of the forecasts will be affected by unexpected events and changing conditions. They also caution that appropriate use of the forecasts must be based on a recognition and understanding of the inherent uncertainties in the data. 5/

However, the general assumption of no policy change has been critized by some who note that such a perspective fails to recognize that assuming the status quo can be as much a policy position as advocating change. 6/ They suggest it is unclear that when Congress mandated EIA to be objective, it didn't want EIA to do analyses of different policy alternatives. Done in unbiased manner, they feel such analyses could prove quite useful to

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4/ U.S. Senate. Oversight of the Structure and Management of the Department of Energy. Hearings, 96th Cong., 1st Sess., 1980. p. 380.

5/ Professional Audit Review Team. Performance Evaluation of the Energy Information Administration. May 19, 1982. p. 21.

6/ See U.S. Senate. Oversight of the Structure and Management of the Department of Energy. Staff Report. 96 Cong., 2d Sess., April 1980.

Congress. However, because EIA has chosen to isolate itself from the policy loop, the usefulness of EIA in contributing to policy debates on important energy issues is somewhat more limited.

Organization of Analytical Function

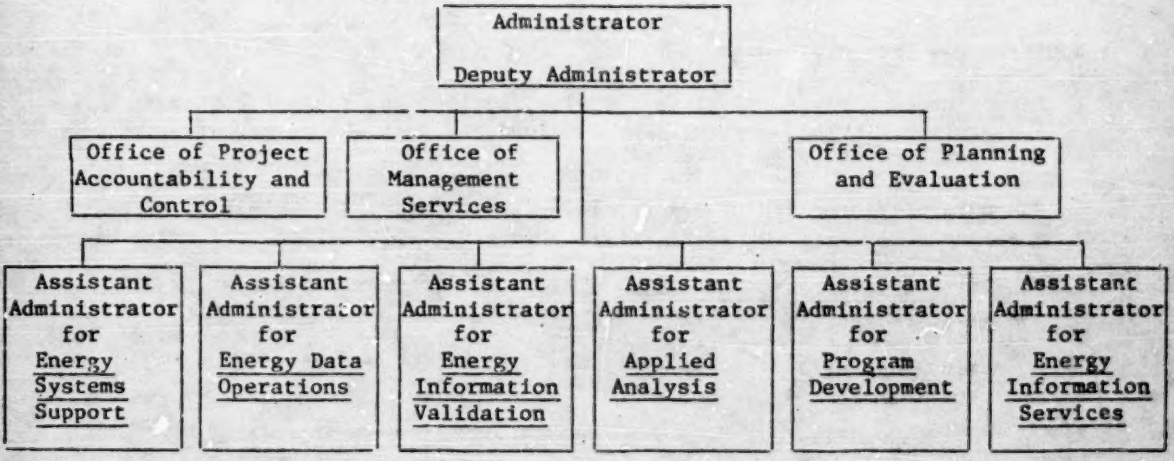
From its conception to July 1981, the Energy Information Administration was organized by functional catagory. (See Figure 1) The analytical component, the Office of Applied Analysis, had five divisions:

Office of Analysis Oversight and Access. This office developed and conducted programs to establish and enhance the quality and accessibility of EIA's analytical tools and products.

Office of Energy Source Analysis. This office developed analyses of various energy supply situations.

Office of Energy Use Analysis. This office developed analyses of various energy demand situations.

FIGURE 1: Organization of EIA until July, 1981


Administrator
Deputy Administrator
Office of Project Accountability and Control
Office of Management Services
Office of Planning and Evaluation
Assistant Administrator for Energy Systems Support
Assistant Administrator for Energy Data Operations
Assistant Administrator for Energy Information Validation
Assistant Administrator for Applied Analysis
Assistant Administrator for Program Development
Assistant Administrator for Energy Information Services

Source: Department of Energy

Office of Integrative Analysis. This office developed short-, mid- and long-term analysis of the overall energy situation.

Office of Economic Analysis. This office developed macro- and micro-economic analysis for EIA.

Allowing for such some reorganization within these five divisions, this organizational structure lasted until July 1981. In July 1981, the Energy Information Administration was reorganized according to substantive rather than functional areas. This new organizational structure (illustrated in Figure 2) provides for "cradle to grave" coverage of fuel sources and use. Each office is responsible for the data collection, program development, and analysis of their individual fuel sources or use. With the supply-side responsibility of the former Office of Applied Analysis parceled out to the new Office of Oil and Gas and the Office of Coal, Nuclear, Electric and Alternative Fuels, and some of the quality assurance responsibility to the new Office of Statistical Standards, the demand side, integrative, and economic analytical components have been lumped together under a new Office of Energy Markets and End Use. This latter new office has four divisions:

Energy End Use Division. This division develops analyses of energy consumption, including integrated mid-term forcasts of energy supply and demand based on sector models.

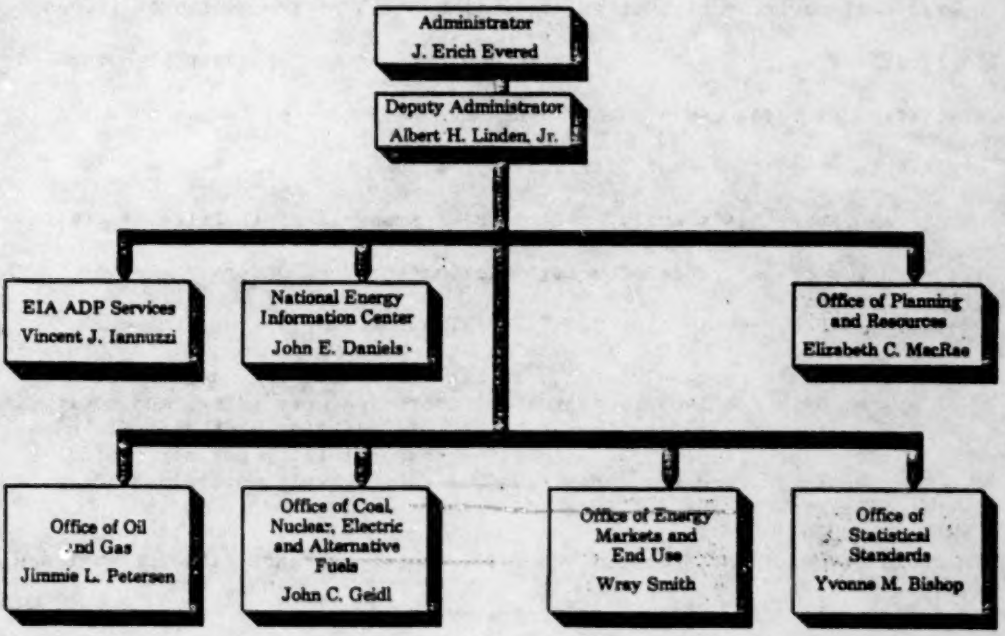
Short-term Information Division. This division develops integrative analyses of short-term energy supply and demand situations.

Longer-Term Information Division. This division develops integrative analyses of long-term energy supply and demand situation.

Economic and Statistic Division. This division develops analyses of economic and financial matters.

This new organizational structure represents the Administration's emphasis on energy supply and market solutions. While supply alternatives are organized into two offices under the Administrator, energy demand is

FIGURE 2: Present EIA Organizational Structure



Source: Department of Energy

relegated to a division within the Office of Energy Markets and End Use. The breaking up of the analytical function of EIA makes integrative analyses of energy supply and demand and their interaction with economic factors more difficult to perform with different offices having operational control over various models.

These organizational limitations are exacerbated by the turmoil caused by any reorganization and particularly by EIA's handling of the reorganization. As stated by PART in their recently released annual

report on EIA, operational changes resulting from the Administration's view of the Federal role in energy information has "created an unsettled operational environment that is not unlike EIA's environment when it was instituted 4 years ago." 7/ Such an environment makes proper planning and allocation of resources--acutely necessary in a time of budget cuts and diminishing resources--more difficult.

Fragmenting EIA's analytical function among several offices increases the need for proper procedures for tracking analyses underway at the agency. In their evaluation of EIA, PART has found that:

> ...since the reorganization, EIA has not developed a centralized system or effective procedures for approving, recording, and monitoring the status of requests for analyses. In addition, although EIA's three major offices have been given responsibility for performing the analysis requests, they have not collectively maintained adequate information on the analyses. 8/

In the absence of intra-office knowledge of the current status of analyses, cooperation between offices on integrative analyses would seem even more difficult.

The technical nature of EIA coupled with budget constraints suggest the need for an optimal mix of personnel and qualifications to accomplish EIA's mission. However, PART stated in its 1982 review of EIA that "in assigning its staff to the new offices, EIA gave inadequate attention to determining the number or types of skills each office needed." 9/ EIA did no study of its staffing needs, either in terms of numbers or skills, in order to carry out its

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7/ Professional Audit Review Team. Performance Evaluation of the Energy Information Administration, May 19, 1982. p. 9.

8/ ibid., p. 18.

9/ ibid., p. 9.

responsibilities under the law in a professional manner. 10/ This current lack of proper personnel placement combined with the organizational fragmentation of EIA's analytical base puts in doubt EIA's ability to do analyses in a timely or efficient manner, particularly in the short-term.

Analytical Capability

In developing an analytical capability, EIA has chosen to rely on a formal modeling process to develop and utilize the current state of knowledge of energy demand and supply, and their interactions with the economy. A listing of EIA's current inventory of models is presented in Appendix A as published by EIA in their 1981 Annual Report to Congress. At one time, EIA had about 60 models in use or being developed. This inventory has shrunk in recent years as budget cuts have forced archiving of some models. Appendix A indicates that the current EIA inventory stands at about 40 models, although the FY1983 DOE request to Congress indicates only 32 models are being maintained for this year. 11/

These models can be divided into four catagories: (1) short-term models, (2) detailed sector and fuel models, (3) mid- and long-term integrative models, and, (4) privately-owned contracted models (DRI, Chase, etc.) The models which make up the Short-Term Integrated Forecasting System (STIFS) are fairly simple demand-oriented models involving national-level data and a forecasting period of up to two years. Macroeconomic inputs into the system are provided by DRI's macroeconomic model. This short-term system is the basis of the Department's quarterly "Short-Term Energy Outlook" publication which forecasts future supply and demand for the next five quarters.

10/ ibid., p. 9.

11/ Department of Energy. Congressional Budget Request: FY1983. February 1982, p. 119.

Most of EIA's models are either sector or fuel models. (See Appendix A). Some of these models are very detailed and have significant data requirements. Models like the Oak Ridge National Laboratories Structural Residential Energy Use Model and the Structural Commercial Energy Use Model are considered to be state-of-the-art in terms of methodology and sophistication. These models have taken years to develop, are continually being refined, and represent the current state of knowledge about various energy-related interactions, such as price elasticity, energy usage, and market penetration. Besides being used individually for some analyses, many of these models provide input into larger integrative models.

Integrative models attempt to integrate the input of various supply and demand sector models into an overall forecast given certain economic assumptions. The EIA's Midterm Energy Market Model is the integrating model for EIA's mid-term forecasts. It can produce forecasts on U.S. energy requirements; the mix of fuels necessary to satisfy these requirements, and their markets prices; the geographic region from which these fuels will be extracted or imported; the methods for converting the raw fuels to petroleum products or electricity; models of distributing these fuels throughout the country; and the types and capacities of new energy-related facilities required to satisfy energy demands. This kind of detail is not available in other publicly available forecasts. Obviously, the entire modeling system, including the submodels, is quite large and very time-consuming to run and interpret.

Finally, EIA subscribes to several commercially available models, primarily to provide economic inputs into their energy models. These private models include Wharton Annual and Industry Forecast Model, Data Resources, Inc. Quarterly Econometric Model of the U.S. Economy, and Chase Macroeconomic Model.

Proposed Budget Cuts and their Impact

As in FY1982, the Reagan Administration is calling for major cuts in EIA's budget for FY1983. For the professional analytical capability of EIA, these cuts would have a significant impact. As indicated in Table 1, all three analytical offices under the reorganization would be cut. In particular, the budget of the Office of Energy Markets and End Use, where most of the analytical capability resides, would be reduced from $7.2 million to $2.1 million

TABLE 1: EIA Budget for Analytical Offices
(thousands of dollars)

	FY 1981 Appropriation	FY 1982 Appropriation	FY 1983 Base	FY 1983 Request
Collection, production, and analysis				
Operating expenses.....				
Oil and gas.....	$17,202	$17,712	$17,712	$13,780
Coal, Nuclear, Electric, and Alternate Fuels.....	6,606	7,680	7,680	6,000
Energy Markets and End Use....	9,658	7,205	7,205	7,100
Program Direction.....	20,143	17,785	17,785	12,759
Subtotal	$53,609	$50,382	$50,382	$34,639
Total, Collection, production, and analysis.....	$53,609	$50,382	$50,382	$34,639

Authorization: P.L.'s 75-688, 93-275, 93-319, 94-163, 94-385, 95-619, 95-620, 95-621, 96-102, 96-294, and 16 USC 791a et. seq.

Summary of Changes

FY 1982 Appropriation enacted.....	$50,382
FY 1982 Base.....	$50,382
Program Decreases:	
Oil and Gas	
o Elimination of the National Oil Import Reporting System extension and consolidation, extension of the Weekly Petroleum Status Report to refinery districts, mid- and long-term analysis in the oil and natural gas areas.....	- 3,932
Coal, Nuclear, Electric and Alternate Fuels	
o Elimination of selected coal, electric, and alternate fuel data systems, elimination of further refinements in existing systems and models; elimination of mid- and long-term analysis in the areas of coal, nuclear energy, electric power, and alternate fuels....	- 1,680
Energy Markets and End Use	
o Elimination of large and complex mid- and long-term integrating models, the Financial Reporting System, and the Energy Emergency Management Information Program; elimination of further refinements in existing systems and models; reduction in the consumption program to a scaled down residential survey.....	- 5,105
Program Direction	
o Elimination of salaries, benefits, and travel for 128 full-time equivalent staff years who will no longer conduct the above activities.....	- 5,026
FY 1983 Budget Request.....	$34,639

Source: Department of Energy

under the proposed budget. (The 1980 budget for the old Office of Applied Analysis was about $11 million.) As noted in the budget document, projections of mid- and long-term energy situations by all three offices are to be eliminated, along with research to improve and refine EIA's modeling capability. Also, an unspecified number of data systems are to be eliminated in FY83. Table 2 indicates the anticipated functions of EIA for FY83, including modeling capability.

TABLE 2: Anticipated Functions of EIA under Budget Proposal

	FY 1981	FY 1982	FY 1983
Oil and Gas			
Data gathering systems maintained	46	42	33
Models maintained	8	6	3
Data reports prepared	138	135	88
Analyses and interpretive reports prepared	26	24	17
Forecasts prepared	27	24	13
Coal, Nuclear, Electric, and Alternate Fuels			
Data gathering systems maintained	27	26	21
Models maintained	16	14	12
Data reports prepared	23	20	19
Analyses and interpretive reports prepared	13	16	13
Forecasts prepared	5	5	3
Energy Markets and End Use			
Data gathering systems maintained	9	9	4
Models maintained	26	14	6
Data reports prepared	16	13	8
Analyses and interpretive reports prepared	20	12	7
Forecasts prepared	11	8	5

* Workload indicators do not take into account varying complexity factors; therefore, units of measurement are not necessarily comparable. For example, the Oil and Gas Reserves system is much larger, involving many more respondents and generating more data than on Coke Plants system. Each counts as one system.

Source: Department of Energy

According to Table 2, the number of models maintained by EIA would be reduced from 34 in FY82 to 21 in FY83. Most of this reduction would come in the Office of Energy Markets and End Use which would be reduced to 6 models from 26 in FY1981. Depending on how EIA defines a model, this reduction could leave the Office of Energy Markets and End Use with only the STIFS system and the commercial models necessary to run it. 12/ Such an end result would sharply reduce EIA's analytical capability, because EIA's ability to do comprehensive and detailed analysis of energy demand alternatives and energy-economic interactions would be essentially eliminated. STIFS provides data at the national level and is demand-oriented; it can not integrate energy supply and demand. Specifically, some of the capability affected by archiving the various Office of Energy Markets and End Use models include:

Analysis of International Situations. Capability affected would include forecasting and analysis of the effects of OPEC pricing and production strategies and U.S energy policy on world energy supplies, demands, and international trade in energy.

Analysis of Energy Demand. Capability affected would include detailed analysis of the economic, technological, and demographic determinants of residential, commercial, and industrial demands, along with forecasting of quantity of fuel demand and fuel mix by end use according to those determinants.

Simulation of Oil Disruptions. Capability affected would include ability to simulate the economic effects on the U.S. economy of short-term disruptions in oil supply and state-level projections of gasoline consumption which could be useful for states or the federal government in coping with a disruption.

Mid- and Long-term Forecasting. Capability affected would include analysis of mid- and long-term impact of various alternative energy policies on the U.S. economy and energy situation. This information lost would include projected fuel consumption by region, distribution, import levels, prices, location of future supply and the capacities of new energy related facilities required to satisfy energy demands.

12/ In Appendix A, EIA has separately listed the various models which compose the STIFS system and the various commercially-available economic models. Since DOE declined to specify which models would be eliminate in FY83, it is assumed the list provided by EIA in their Annual Report to Congress is the definitive list, and the breakdown an accurate reflection of DOE's definition of a model.

The loss of data systems noted in Table 2 could affect the effectiveness of EIA's remaining models along with the commercial models. The STIFS models and the various commercial models are generally oriented toward analysis of energy demand. However, as noted in Table 2, the number of data systems maintained by the Office of Energy Markets and End Use (the "demand side" office) would be reduced from 9 in FY81 and FY82 to 4 in FY83. Because private modeling establishments, along with EIA, have come to rely on EIA data for input into their models, the loss of data could affect the flexibility and reliability of these models in the future, depending on the data bases eliminated.

This limitation in the EIA modeling capacity also means that EIA will no longer be able to simulate energy supply and demand market conditions. As noted, many of the detailed energy supply and end use models were developed also as inputs into EIA integrating models--models which balance the supply side picture as developed by the supply models with the demand side picture as developed by the end-use models. With the loss of the detailed end-use models and the complex integrating models, EIA would have to rely on demand-oriented STIFS or commercial systems for simulations of potential market conditions, including supply disruptions. This would make analysis of any supply side response to various economic or market conditions (domestic or international) more difficult.

The supply-oriented offices within EIA would also lose analytical capability, although apparently to a lesser degree. Specifically, the Administration's budget request calls for archiving the National Coal Model, one of the most detailed and comprehensive coal models in existence. Its capability includes projection of state coal production, coal transportation flows and fuel consumption by electric utilities. Other analyses to be dropped by the Administration include coal export analysis, coal-based synthetic fuel

analysis, mid- and long-term electric power projections, and cost-benefit analysis of advanced nuclear technology, and alternative energy sources.

The ability of EIA to use this archived capability in the future would depend on its personnel. Extensive knowledge of a model and substantive expertise in the subject area being examined are necessary for the proper operation of a model and intepretation of results. As shown in Table 3, the Administration plans significant personnel cuts in the three collection-, production- and analysis-oriented offices within EIA. In particular, the Office of Energy Market and End Use would lose about half its personnel under the proposed budget. Presumably, these reductions would come in mid- and long-term forecasting expertise, forecasting the Administration no longer intends to do. Such a loss would make recovery of the analytical capability lost under the proposed budget difficult.

Beside the loss of analytical personnel, the EIA would also lose a research network organized to enhance EIA's analytical capability by improving and refining EIA's modeling capability. As noted in Table 1, the

TABLE 3: Personnel under Budget Proposal

Collection, Production, and Analysis is requesting funds to support 338 full-time equivalent staff years for FY 1983.

	Full-time Equivalents	
	FY 1982	FY 1983
Oil and Gas	206	171
Coal, Nuclear, Electric, and Alternate Fuels	137	105
Energy Markets and End Use	123	62
Total, Collection, Production, and Analysis	466	338

Source: Department of Energy

Administration is recommending that all research into refining existing models be eliminated, including reduction of the consumption program to a scaled down residential survey. Hence, the process of continual advancement of the understanding of energy-economic interactions as embodied in EIA's modeling capability would be halted. This elimination of research would significantly affect groups like Oak Ridge National Laboratories which has pioneered energy demand modeling, and whose work is considered state-of-the-art in terms of methodology and sophistication. Also, some states and localities periodically use EIA models for their own planning purposes. For example, the Oak Ridge Structural Residential End-use model has been used by groups ranging from the Wisconsin Public Service Commission to the City of Seattle Energy Office. To the extent these enities need such capability in the future, the "mothballing" of these models could affect their ability to make decisions based on the best analysis possible.

Rationale for Reducing EIA's Analytical Capability

Private energy-related corporations frequently use models and analysis to test decisions based on a variety of potential futures. As stated by Sheldon Lambert of Shell Oil in testimony before the House Committee on Science and Technology:

> ...These projections [of future energy supply and demand] are used primarily to test decisions we must make today against a number of potential futures and thus provide a vehicle for risk assessment and contingency planning. In using any projections, we try to keep in mind the principle that "No one can really guarantee the future;" the best we can do is size up the chances, calculate the risks involved, estimate our ability to deal with them, and then make our plans in confidence. 13/

13/ U.S. House. Summary of Hearings on Energy Demand Forecasting and its Appropriate role in Planning and Policy. 97th Cong., 1st sess., September, 1981, committee print. p. 22.

However, the need of government for analysis is different from that of private corporations. The concerns are broader, and the impact of decisions greater. As stated by Mr. Lambert in the same hearing:

> While we [in private enterprise] try to plan for future energy market conditions, you in the government, as policymakers and initiators of legislation, in large measure determine the future. Consequently, as part of your deliberations, you must account for the possible effects of your legislation on the United States energy economic future. It is in this context that energy projections and their supporting models can assist you in determining the magnitude and direction that proposed policy may have when balancing the extremely complex equation of future energy supply and demand.
>
> However, scenario-based projections done by industry, where the main intent is to facilitate allocation of an individual company's resources may be too focused or limited for policy guidance. Company energy planners may be indifferent to some aspects of future economic or political activity which are important to government planners. For example, the government study on the effect on the U.S. energy supply if the Straits of Hormuz were blockaded is the type of crisis scenario that falls within the province of government only. Although a company may have a contingency crisis plan which considers this eventuality, they would certainly not address all of the many detailed political and economic ramifications needed by government planners. 14/

The Administration's rationale for reducing EIA's analytical capability is philosophical: the country should rely on a "free market" to guide American energy policy, not analysis. As stated by Roger Naill of DOE:

> ...I also need to emphasize that models are not substitutes for the market. Because our models cannot anticipate precisely how the world will change, it would be a mistake to rely on national planning through models and fail to rely on markets--that is, the decisions of millions of American consumers, workers, and businessmen who will determine our energy future. 15/

The Administration's response to those who argue the need for a major energy-related government analytical capability is to argue that the government's

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14/ ibid., p. 22.

15/ ibid., p. 23.

need for analysis will be reduced as the Administration reduces the government's role in the economy. As stated in the Administration's National Energy Policy Plan:

> The Administration's reformulation of policies affecting energy is part of the President's comprehensive Program for Economic Recovery, which includes elimination of excessive Federal spending and taxes, regulatory relief, and a sound monetary policy. When fully implemented, the Economic Recovery Program will release the strength of the private sector and ensure a vigorous economic climate in which the Nation's problems, including energy problems, will be solved primarily by the American people themselves--consumers, workers, managers, inventors, and investors. 16/

In the case of energy, the Administration has already introduced a bill--"Energy Information Amendments of 1981"--to reduce the data collection responsibilities of the EIA. It also announced in its budget request for EIA its intentions to introduce similar legislation to reduce the analytical responsibility of EIA. Such a change in law would be necessary for the EIA to implement the reductions in analytical capability envisioned in the budget request and still meet its mandated responsibilities to any professional standards. However, the data bill has not seen any action in the Senate, and the analytical bill has yet to be introduced.

Summary

EIA was formed by Congress to develop the objective, unbiased information and analytical capability members felt was necessary for the country to deal effectively with its energy problem. In doing so, the Congress mandated that the EIA perform various analytical tasks periodially for use by the Congress and the Executive Branch. As the Congress enacted more energy legislation, the need for analysis increased, and the mandated requirements for EIA analysis also increased.

16/ U.S Department of Energy. "Securing America's Energy Future: The National Energy Policy Plan." p. 3.

In keeping with its philosophy of minimal federal involvement in energy policy, the Administration is recommending significant cuts in the analytical ability of EIA. If implemented, the cuts would severely limit the EIA's ability to analyze various energy market conditions. Also, improvement and refinement of EIA's analytical capability would be halted.

To implement such a reduction in analytical capability would require a change in current law. To reduce data collection, the Administration has already introduced a bill in the Senate. However, the Administration has not yet introduced a bill to reduce EIA's analytical responsibilities. In deliberating on such legislation and the EIA budget, the Congress will have to determine to what extent reducing the current Federal involvement in energy policy and associated expenditures should be accompanied by a reduction in the government's ability to analyze the domestic and international energy situation.

Inventory of Energy Information Administration Models

Appendix A

This appendix describes modeling capabilities, both in use and under development, within the Energy Information Administration. The models are listed by the office in which they are maintained. Models denoted by an asterisk will be used to produce the forecasts in the *1981 EIA Annual Report to Congress*, Volume Three.

The Midterm Energy Forecasting System (MEFS) is an extensively developed national forecasting system. It provides the Department of Energy's major midterm (5 to 15 years) integrated forecasts and analyses. MEFS incorporates many individual models and methodologies; the models that serve as major components are the Midterm Energy Market Model (MEMM), the National Coal Model, the Demand Analysis System (DAS), and the National Aggregate Refinery Model (NARM).

MEFS is used to forecast energy prices, supplies, demands, and conversion activities. As an analytical tool, it helps examine the potential impact of changes in Federal policies by using alternate scenarios reflecting the appropriate world oil price, tax, and regulatory conditions, as well as other variables. Differing resource and technological option assumptions (e.g., high versus low discovery rates of oil and gas), and the comparative impacts of differing political, tax, and regulatory environments can be examined. The entire system will be used to produce the *EIA Annual Report to Congress*, Volume Three.

Source: EIA Annual Report to Congress, volume I.

Office Of Oil And Gas

Natural Gas Division

***National Aggregate Refinery Model (NARM).** Describes short-term and midterm refinery operations. This model uses the Refinery and Petrochemical Modeling System (RPMS), an operational, commercially available, matrix generation, report writer, and data base. The system can be used at different levels of aggregation to describe a single refinery or operations at the regional or national level. NARM is a major component of the Midterm Energy Forecasting System.

***Alaskan Hydrocarbon Supply Model.** Forecasts midterm Alaskan oil and gas production at different price levels. This is an operational model that addresses questions concerning the effect on supply of resource availability, the construction of new pipelines, and Government leasing policies. Forecasts are for 40 years in 5-year increments, with the current geographical scope covering 20 regions. The model's supply curves are used as input to the Midterm Energy Forecasting System.

***Outer Continental Shelf Oil and Gas Supply Model.** Forecasts Lower-48 States outer continental shelf oil and gas supply in terms of exploration and discovery processes influenced by economic and geologic factors. Forecasts may be for up to 30 years in 1-year increments. Supply curves generated by the model will be input to the Midterm Energy Forecasting System. The model, which is under development, uses simulation methods to determine the probable supply of oil and gas at different price levels.

•Enhanced Oil Recovery Model. Projects U.S. production potential for five enhanced oil recovery methods. This model can also analyze the impact of varying price trajectories and policy options such as loan guarantee programs. Forecasts are for 20 years in annual steps for a sample of reservoirs. Supply predictions will be input to the Midterm Energy Forecasting System. This operational model uses engineering estimates to determine production technologies appropriated for different reservoirs. It then applies a discounted cash flow analysis to predict production over time.

Lower-48 Onshore Oil and Gas Supply Model. Forecasts onshore production of oil and gas for the Lower-48 States. It is being developed to consider economic and engineering factors involved in production processes underlying the U.S. onshore Lower-48 States's oil and gas supply. Forecasts will be for 15 to 30 years. Supply predictions will be input to the Midterm Energy Forecasting System.

Office Of Coal, Nuclear, Electric, And Alternate Fuels

•National Coal Model. Projects coal production by State; coal transportation flows; and fuel consumption by electric utilities based on specified levels of electrical generation, existing and planned generating capacity, and the economics of electricity generation. The National Coal Model is a highly disaggregated and fully operational coal supply and allocation model. Coal demand in each of 44 regions are met via a transportation network from existing and new mines in 31 supply regions. Regional supply-price relationships are developed for 40 coal types based on the 1979 EIA Demonstrated Reserve Base, engineering estimates of mining costs from various surface and underground regional mines, and coal-type-specific cost elements. The resource allocation and mine costing portion of this model serves as a major component of the Midterm Energy Forecasting System.

National Utility Financial Statement Model (NUFS). Forecasts operating characteristics and calculates financial statements utilizing the forecasted values, as well as various scenario parameters. The model can simulate alternative impacts on the financial statements of the firm, based upon assumptions about regulatory climate and capital cost. This is an operational accounting model that develops pro forma financial statements. It describes utility financial operations at the regional and national level.

National Utility Regulatory Model (NUREG). Calculates regional capital expenditure constraints which reflect assumptions concerning the regulatory climate and a predetermined minimum level of industry financial performance. The capital expenditure constraints are to be utilized in the capacity expansion decision-making process of the NCM and MEFS to insure financially feasible capacity projection. This model uses the National Utility Financial System to make financial constraints.

Concept V. Provides a rapid means of estimating future capital requirements for construction of different types of central station electric powerplants under various sets of economic and engineering design assumptions. CONCEPT, which is operational, models the construction and capital expense stream (including escalation and interest during construction) for a central power station as a function of the number of generating units, their construction times, geographic locations, plant design and size, and factor cost indexes.

•Powerplant Fixed Charge and Revenue Requirements Factor Model. Computes fixed charge and revenue requirement factors for each competing electric generating plant type represented in the Midterm Energy Market Model. The model captures the capital investment decisionmaking process utilized by the Electric Utility Industry in evaluating electric plants. This model is operational.

•Capital Requirements Estimating Model. Constructs annual estimates through 1990 of the financial investments that are required to build the electric utility generating capacity that is projected in the midterm forecasting models.

Levelized Nuclear Fuel Cycle Cost Model. Computes the cost of a batch (loading) of fuel for nuclear electric powerplants, given various components costs, services costs, and technology conditions. This model is essentially an operational process model that begins with analysis of fuel utilization efficiency inside the reactor core, then proceeds both backward through the fuel processing stages prior to fuel use and also forward in time through the radioactive waste management processes. The economics are analyzed on the basis of input unit prices for fuel cycle services and for uranium. The computation determines the price an electric utility company must charge its customers (per unit of electricity production) to recover its expenses.

Nuclear Fuel Requirements Model (NUFUEL). Generates the nuclear fuel cycle requirements for an assemblage of nuclear reactors, based on each reactor's fuel characteristics and a general scenario description (recycle mode, average capacity factor, enrichment plant tails assay, etc.). This model is operational and can cover a 30-year time span.

Short-Term Nuclear Annual Power Production Simulation (SNAPPS) Model. Simulates the operation of a nuclear power system on a plant-by-plant basis. Such operations include: additions of new generating capacity, shutdowns for refueling, and levels of operating performance (all done on a probabilistic basis). SNAPPS forecasts the expected value and estimated statistical variances of electricity generation (in kilowatt-hours), by year, on a Federal region basis. This model is operational.

Uranium Market Price and Supply (UMPS) Model. Projects domestic uranium market and supply activity for production, price, exploration levels, and other indicators. The time horizon is approximately 60 years. The user must specify a behavioral characterization of the supply and consumption sectors and such geologic parameters as the ultimate resource endowment. This model is an operational predecessor to an international characterization of the supply and consumption sectors and version currently under development.

Office Of Energy Markets And End Use

Energy End Use Division

***Structural Residential Energy Use Model.** Simulates energy use in the residential sector of the economy annually through the year 1995. This is a comprehensive economic/engineering operational model that can be used to forecast demand for energy by fuel (electricity, oil, gas, other), by eight end-use functions (space heating, water heating, refrigeration, freezing, cooking, air conditioning, lighting, and other), and for three types of housing (single-family units, apartments, and mobile homes). The residential simulation model is sensitive to the major demographic, economic, and technological determinants of residential energy use. The Structural Residential Energy Use Model is the residential component of the Demand Analysis System.

***Structural Commercial Energy Use Model.** Provides forecasts of energy use by end use and type of fuel for 1978 through 1995. This operational model is a comprehensive engineering/economic model of commercial energy use. This model considers five end uses (space heating, water heating, cooling, lighting, and other), four fuel types (gas, electricity, oil, and other), and ten commercial subsectors (retail and wholesale, auto repair, finance and other office activities, warehouse activities, public administration, education services, health services, religious services, hotels and motels, and miscellaneous commercial activities). Both economic factors (fuel switching and intensity of use) and technological factors (equipment efficiency and thermal characteristics of buildings) are explicitly represented in the model. The Structural Commercial Energy Use Model is the commercial component of the Demand Analysis System.

Oak Ridge Industrial Model (ORIM). Forecasts energy demand for the midterm by major industrial user, end use, DOE region, and fuel. ORIM is based on both statistical and engineering data and is designed to interface with the Midterm Energy Forecasting System through the Demand Analysis System (DAS). The model is undergoing testing and will be fully operational by the middle of 1981.

State-Level Transportation Energy Demand Model. Forecasts gasoline consumption and vehicle stocks for five classes of vehicles, including automobiles and light-duty trucks at the State level. This model is not currently used in the Annual Report to Congress analysis.

***Demand Analysis System (DAS).** An intertemporal simulation model of U.S. energy demand with four major components: the Structural Residential Model, the Structural Commercial Model, the Oak Ridge Industrial Model, and the Structural Transportation Model. DAS is the demand component of the midterm energy forecasting system and it forecasts the quantity of fuel demanded by major consuming sectors (residential, commercial, industrial and transporation) as a function of prices, macroeconomic variables, and population through 1995. The model can be used to assess the impact of changing energy prices and economic growth trends on the level and composition of fuel demand. The subcomponents of DAS evaluate the impact of these variables on the efficiency and utilization of energy using capital equipment and buildings. The sub-models can also be used to

assess the impact of various conservation measures, appliance standards, building standards, and automobile efficiency standards on energy demand.

***Micro Analytic Transfer to Households/Comprehensive Human Resources Data System (MATH/CHRDS).** Analyzes the impacts of changing energy prices and broader energy policy changes on household direct-energy expenditures by various population subgroups. A model expansion, soon to be completed, allows the estimation of expenditures for commodities other than energy so that the indirect effects of energy price changes on all household consumption can be evaluated. MATH/CHRDS is operational and provides sufficient detail with regard to household characteristics to analyze the impacts of future energy trends and policies across a large number of socioeconomic variables, such as age, race, sex, income, and location. The model also describes the ways in which important energy-related household characteristics change over time in response to economic, demographic, and energy changes.

National Automobile Fuel Demand Model. Forecasts fuel demand for automobile use in the midterm, as well as new car and average fleet efficiency, new car registrations, total automobile fleet, vehicle miles traveled, and fuel demand by type (diesel, leaded, and unleaded). Its use can aid in the analysis of a wide range of issues as it is sensitive to fuel prices, new car prices, socioeconomic assumptions (population, income, and unemployment), diesel car penetration, and new car efficiency. This econometrically derived model is operational and forms a partial basis for the Demand Analysis System transportation sector.

Economics and Statistics Division

Wharton Annual and Industry Forecasting Model. Provides detailed macroeconomic forecasts of the U.S. economy on an annual basis, most recently through 1989 in published form but with computer-accessible results for an additional number of years. The Wharton Model is a representation of the U.S. economy. In addition to projections for final demand components (e.g., investment and personal consumption expenditure) the Wharton Model forecasts employment, output, and capital requirements by industrial sector.

Data Resources, Inc. Quarterly Econometric Model of the U.S. Economy. Provides quarterly macroeconomic forecasts of the U.S. economy through 2006. The forecasts project detailed breakdowns of consumer spending; business investment in plant, equipment, and inventories; construction activity; Government receipts and expenditures; wages; profits and interest; major price indices; and imports and exports. Financial projections, such as interest rates, monetary aggregates, and household and corporate flows of funds and mortgage activity are also available. EIA has developed methodologies for using this operational model in conjunction with in-house energy models to generate macroeconomic simulations of energy scenarios.

***Chase Macroeconomic Model.** Provides quarterly macroeconomic forecasts of the U.S. economy through 2000. The Chase Model is a fully simultaneous network of regression-based forecasting equations, identity relationships, and exogenous variables. The model is used to quantify and analyze the impact of energy policies and actions through linkages developed with in-house energy models.

Energy Disaggregate Input-Output Model (EDIO). Describes the intricate interdependencies among the various producing sectors of the economy. The EDIO Model incorporates a new sectoring format that separates energy producing industries consuming large amounts of energy, and industries consuming large amounts of energy. This model is operational and covers the years 1985 and 1990.

***REGSHARE.** Derives regional economic projections of population, disposable income, and value added for use in regional energy demand models. REGSHARE describes how the Department of Energy regional trends in population, value added by industry, and disposal income are affected by changes in the national economy through 1995. This operational model is the only method currently available in the EIA to project regional industrial production.

Regional Earnings Impact System (REIS). Provides a quick and detailed response capability, allowing analysis of State industrial impacts of alternative energy futures and can be used to estimate the earnings impacts of alternative midterm energy forecasts. The system is extremely flexible and can use any macroeconometric and input-output modeling combination. REIS, which is operational, provides a forecast for specified years through the year 2000.

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Supply Constrained Analysis Model (SCAM). Analyzes the economic effects on the U.S. economy of short-term energy supply constraints. SCAM is a set of econometric and linear programming models that maximize the aggregate level of the economy subject to constraints on the availability of energy products.

Dynamic General Equilibrium Model (DEGM). Estimates the effects of energy policy on economic growth in the United States through the year 2000. The DGEM is an econometric model that combines a nine-sector, energy-oriented interindustry model and an economic growth model. The model is installed on the EIA computer. A 35-sector version of DGEM is under development.

Short-Term Information Division

Petroleum Allocation Model (PAL). Projects international trade patterns in crude oil and refined products through 1995. This operational model uses a linear programming approach to estimate future sources of petroleum imports to the United States and to calculate expected shortfalls in those imports that would result from various supply disruptions.

***Oil Market Simulation Model (OMS).** Projects future world oil prices and world crude oil supplies and demands by region (the United States, Canada, Japan, OECD-Europe, developing countries, and net Communist trade) on an annual basis through 1995. The OMS Model is operational and is used as an adjunct to the International Energy Evaluation System.

***International Energy Evaluation System (IEES).** Analyzes the effects of the Organization of Petroleum Exporting Countries (OPEC) pricing and production strategies and U.S. energy policies on world energy supplies, demands, and international trade in energy. IEES is currently operational and is a partial equilibrium model of world energy supply and demand that can be simulated for the years 1985, 1990, and 1995. For each major industrialized country in the western world, IEES simulates total energy demands by product type, consuming sector, and source of supply. Energy-specific supplies and demands are equilibrated vis-a-vis market prices for each energy product. The simulations are driven by output from the OECD demand and the Developing Countries Energy Demand (DCED) submodels of IEES, and can incorporate assumptions concerning OPEC policies, U.S. energy policies, and constraints on world energy production. IEES also treats in less detail other areas of the world, such as the centrally planned economies.

Short-Term Integrated Forecasting System (STIFS). Provides a national monthly data base and accounting framework for the national energy supply, demand, stocks, and conversion processes (refineries and electric utilities). This model balances historical data and forecasts the entire energy network for up to 2 years in the future.

Short-Term Motor Gasoline Demand Model. Forecasts national total demand at monthly intervals over a 2-year forecast period. This model is an operational econometric model, capable of analyzing impacts of alternative monthly projections, gasoline prices, economic growth of disposable personal income, vehicle stocks, and the efficiency of the stock of monthly motor gasoline demand. In addition, the price elasticity of demand can be varied by the user to investigate the impact on demand of the parameter. The demand forecasts are used as inputs to the Short-Term Integrated Forecasting System (STIFS).

Short-Term Electricity Demand Model. Estimates the total generation of electricity on a national level by month. No disaggregation by end use is performed. This model is an operational econometric model in which total generation is assumed to be a function of the relative price of electricity and natural gas, time, weather, and seasonal factors. The forecasts are used as inputs to STIFS.

Short-Term Non-Utility Distillate and Residual Demand Models. Produces short-term monthly national projections of nonutility distillate and residual demand, based on product supplies time-series data. The distillate portion of the model uses ordinary least squares time-series analysis; the residual portion uses Cochrane-Orcutt estimation techniques. The demand forecasts are used as inputs to STIFS.

Short-Term Energy Price Projection System. Forecasts prices for major energy products. This operational model considers refinery operating levels, domestic crude oil production rates, inflation rates, taxes, and Department of Energy pricing rules. Forecasts are for 1 to 2 years in monthly increments.

Longer-Term Information Division

***Long-Term Energy Analysis Program (LEAP).** Describes the overall energy system of the United States, from 1975 to 2030, in 5-year intervals. The various processes of energy production, conversion, transportation, and end use are individually represented.

A representation of market penetration is used to analyze new technology contributions over the forecast period. A particular model constructed using LEAP consists of a network description of the problem from energy sources to energy uses, combining appropriate processes where necessary. The solution to such a problem describes energy flows and prices, over the network, for the time interval. This model is used to produce the long-term forecasts for the *EIA Annual Report to Congress*, Volume Three.

•**Electric Utility Dispatching Model.** Portrays the conversion of fuels into electricity. This submodel of the Midterm Energy Market Model (MEMM) is operational and is also used on its own outside of the MEFS. It is a linear program with activities to operate or build plants of about 23 types, distinguished by fuel type and physical characteristics such as heat rates. The Electric Utility Dispatching Model, given fuel prices, capital shares, and other costs, acts as a submodel for MEMM, determining the mix of plants to satisfy demand in base, cycling, daily peak, and seasonal peak loads.

•**Midterm Energy Market Model (MEMM).** Describes the state of the energy market for selected target years, including details of fuel consumption by region and sector, domestic production by region, transportation and distribution of fuels, import levels, and regional energy prices. This operational model also serves as the integrating model for the Midterm Energy Forecasting System. When operated in conjunction with that system, MEMM can produce forecasts on the following topics: U.S. energy requirements in the next 5 to 15 years; the mix of fuels necessary to satisfy these requirements, and their market prices; the geographic regions from which these fuels will be extracted or imported; the methods for converting the raw fuels to petroleum products or electricity; modes of distributing these fuels throughout the country; and the types and capacities of new energy-related facilities required to satisfy energy demands.

CHAPTER III

THE EFFECT OF PROPOSED CUTS IN THE DATA VALIDATION PROGRAM AT THE ENERGY INFORMATION ADMINISTRATION*

One of the principal reasons for the establishment of the Energy Information Administration (EIA) was to provide accurate and reliable information about the energy situation in the United States. 1/ According to the Department of Energy Organization Act (Public Law 95-91),

> The Administrator shall be responsible for carrying out a central, comprehensive, and unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information which is relevant to energy resource reserves, energy production, demand, and technology, and related economic and statistical information, or which is relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs. [Sec. 205(a)(2)] (emphasis added)

The concern for providing the Government with accurate, reliable and valid information about the energy situation in large part appears to have been a function of public and Congressional distrust, during the 1973 and 1974 oil crisis, of the energy industry--one of the major sources of information about the energy situation. 2/

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1/ U.S. Congress. Senate. Committee on Governmental Affairs. Oversight of the Structure and Management of the Department of Energy. V. Energy Information Administration. Committee Print, 96th Cong., 2nd Sess. Washington, U.S. Govt. Print. Off., December 1980. p. 175.

2/ Ibid., p. 135.

Responding to these concerns, Secretary of Energy James Schlesinger stated in a letter to the Chairman of the Professional Audit Review Team (PART) dated November 7, 1977, just after the establishment of EIA, that,

> ...to ensure an aggressive and positive effort for verifying the accuracy and validity of energy information, the data validation function has been separated and elevated to an Office Energy Data Validation, headed by an EIA Assistant Administrator. This office is one of three major offices in EIA (the other two being the Office of Energy Data and the Office of Applied Analysis). In addition, a firm commitment has been made to staff this office with the necessary resources required to carry out a comprehensive data validation program. One of the first tasks in this area will be to develop a detailed program plan which includes schedules and resources required to ensure the validation of all energy data systems. This program will include major efforts to build validation mechanisms into new data systems as they are developed. 3/

PART is an interagency team established by law to review and evaluate EIA's status and report annually on EIA activities.

This report is an overview of the energy information evaluation program as carried out at EIA and an examination of the changes that may have occurred as a result of the current Administration's policies and their possible impact on the validation of the energy information collected and compiled by the Federal Government.

The report is divided into three parts. There is a brief review of the activities of EIA in the area of validation in the first years of its existence. The impact of the July 1981, reorganization of EIA, the impact of the FY1982 and FY1983 EIA budget cuts, and the impact of the de-control of gasoline on the validation program are examined. Finally, there is a brief inquiry into the potential impact of the passage of the EIA Amendments of 1981 (H.R. 5923) on energy data validation.

3/ Professional Audit Review Team. Report to the President and the Congress. Activities of the Office of Energy Information and Analysis, Federal Energy Administration. December 5, 1977. Washington, D.C. p. 49. (Hereafter noted as PART Report, 1977)

LIMITATIONS OF THIS REPORT

The paper is a general overview of the energy data validation program established within EIA and the possible effects of various changes either proposed or already carried out by the current Administration. It is not meant to be an evaluation of the validity or reliabilty of any of the energy data sets currently collected by EIA. Such an evaluation to produce adequate information would require field studies, which are beyond the current resources of CRS.

The report is based on a review of documents on the validation work conducted by EIA, the three PART evaluation studies, and discussions with various individuals who either have been involved in the validation work at EIA or are familiar with its work.

MAJOR FINDINGS OF THE STUDY

-- During the period October 1977 to February 1981, EIA was strongly committed to assessing the validity and reliability of the energy data series for which it had become responsible. EIA established an independent Office of Energy Information Validation, headed by an Assistant Administrator who reported directly to the EIA Administrator.

-- Earlier PART studies showed that EIA, during the period 1977 to 1981, had not determined the accuracy of most energy information series transferred from previous agencies, or collected or compiled by EIA.

-- De-control of the oil industry and major budget constraints in FY1982 have reduced EIA's ability or the necessity--in the cases of expired data series--to conduct energy information validation studies.

-- Budgetary constraints at EIA led to a reorganization in July 1981. The effect of the reorganization was to de-emphasize energy data validation and replace it with an emphasis on quality assurance--"which appraises the objective properties of the resulting energy information"--and limited quality control--"which ensures that the information product corresponds to explicit specifications." Furthermore, the reorganization decentralized the quality control operation and made it the responsibility of the individual program offices rather than having an independent office totally responsible for such activities.

-- The proposed reduction in EIA's budget for FY1983 would appear to indicate that the more modest quality control and quality assurance measures that had been planned may not be carried out.

-- The proposed EIA Amendments of 1981 would further reduce the energy information requirements of EIA, and consequently, the need for data validation studies. As proposed, however, it is unclear whether or not the bill would allow EIA to save money by sharing sampling frames with the Bureau of the Census since it would appear that it does not amend Title 13. The bill would allow sharing of the Bureau of Labor Statistics sampling frames and would not only save money but provide EIA with a validated and clearly understood universe from which to draw its samples.

DATA VALIDATION AND VERIFICATION AT EIA: 1977-1980

From the establishment of EIA until July 1981, the primary responsibility for energy data validation and verification was given to the Office of Energy Information Validation (OEIV), headed by an Assistant Administrator who reported to the EIA Administrator. Validation, verification and sensitivity testing of the energy models used by EIA and forecasts based on these models was the responsibility of OEIV and the Office of Analysis Oversight and Access under the Assistant Administrator of Applied Analysis.

Office of Information Validation

According to the November 1980, PART Report,

> OEIV has three principal offices. They are the Offices of Validation Resources, Validation Analysis, and Systems Validation.
>
> The Office of Validation Resources is responsible for assuring that the required information, means, support, services, and resources are available to carry out OEIV's responsibilities. This Office is also responsible for assisting in the editorial preparation, review, and coordination of OEIV's products, keeping account of energy projections made by the Office of the Assistant Administrator for Applied Analysis, and reviewing EIA publications for appropriate statements regarding the quality of energy information.
>
> The Office of Validation Analysis is responsible for:
>
> --Developing concepts and methodology for data validation and for reviews of requirements for information in broad subject areas. The methodology and knowledge developed are applied to specific validations, in order to assist in analyzing their results, and to provide general technical support to the rest of OEIV.
>
> --Reviewing the verification work of the Office of Applied Analysis and evaluating the requirements for model output, for examining the logical, mathematical, and statistical structure of the model, for evaluating input data and parameter values, and for assessing the meaningfulness and accuracy of the model output in terms of its use and whether or not it satisfies the users' requirements.

--Examining the consistency among data series and duplication among data collection instruments, and conducting special studies of data quality.

The Office of Systems Validation acts as the primary operating arm of OEIV. This Office reviews proposed data collection systems, conducts field validation, and completes system validation reports. 4/

During the period October 1977 to February 1981, OEIV steadily grew to meet its responsibilities. Between October 1977 and March 1979, the staff of professionals grew from 2 to 27, and by June 1980, OEIV had 37 full-time professionals: 7 in Validation Resources, 15 in Validation Analysis, and 12 in Systems Validations. 5/ Because much of the work of OEIV is done through contract, $3 million had been appropriated in FY1978 and $4 million in FY1979 for contract work. 6/ The FY1980 contract budget for OEIV was $10.3 million--77% of the total OEIV budget. 7/

During the period October 1977 to February 1979, OEIV contracted out to three organizations to validate 14 of the 55 existing EIA energy information systems, covering 15 of a total of 185 data collection forms. The responsibility of these contractors was not only to validate the information systems, but to develop acceptable validation methodology. OEIV assisted in the development of

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4/ Professional Audit Review Team. Report to the President and Congress. Activities of the Energy Information Administration, Department of Energy. November 13, 1980. Washington, D.C. p. 11. This information about the organizational structure and functions within OEIV is based on EIA organizational charts, missions, and functions provided to PART. (Hereafter noted as PART Report, 1980)

5/ Professional Audit Review Team. Report to the President and Congress. Activities of the Energy Information Administration, Department of Energy. May 7, 1979. Washington, D.C. p. iv. (Hereafter noted as PART Report, 1979); PART Report, 1980, p. 12.

6/ PART Report, 1979, p. iv.

7/ PART Report, 1980, p. 12.

three new energy information systems--The Financial Reporting System, The Oil and Gas Information System and the Annual Survey of Domestic Oil and Gas Reserves--by providing validation support to determine the requirements of the data collection efforts. In February 1979, OEIV developed a program plan for future work in validation that, among other aspects, set out the plan to validate all 55 of the existing energy information systems by 1986. 8/

During the period April 1979 to June 1980, OEIV issued four validation reports and further developed plans for the evaluation of the remaining 51 energy information systems. OEIV performed reviews of requirements of six new energy information areas started by EIA in 1978 or 1979, conducted 20 special studies for the EIA Administrator or Members of Congress, reviewed 201 proposed or revised data collection forms, and started work on the validation of two energy models--the Short-term Integrated Forecasting Systems and the Long-term Energy Analysis Package. 9/

PART Evaluation of Validation Efforts and EIA's Response

Overall, the PART's evaluations of the validation efforts of EIA energy information systems for the period of time from October 1977 to February 1982 can be summarized by a quote from the 1980 PART Report:

> PART believes that because of limited validation efforts conducted thus far, the accuracy of most energy information is undetermined. 10/

8/ PART Report, 1979, p. 12-13, 18-20.

9/ PART Report, 1980, p. 17, 21-23.

10/ Ibid., p. iii.

More specifically, for the period of its first review--October 1977 to March 1979--PART, while noting some accomplishments of EIA in the first year and a half of its existence, expressed the view that "little has been accomplished in the way of improving the accuracy, reliability, and overall credibility of energy information." 11/ OEIV had a good deal of difficulty with the contracts that were given to the three contractors, and after one and a half years, only two preliminary reports had been issued at the time of the PART review. PART attributed this to "the lack of a clearly defined statement of its (OEIV) mission and a program plan laying out how that mission can be best accomplished." 12/

PART noted the development of such a program plan in February 1979:

> The PART believes that a clear and carefully thought-out data validation program plan that systematically identifies attainable objectives was an essential prerequisite to developing an effective, well-managed data validation program. The Validation Office has now developed such a program in February 1979 after operating for over a year without one. 13/

Responding to the EIA Administrator's view that progress had been made in the development of a data validation methodology, PART states,

> We believe that assessing the accuracy and reliability of energy data should be the Validation Office's highest priority and the lack of tangible results in the way of completed validation reports or evidence that a satisfactory data validation methodology was being developed supports our conclusions that EIA had made little progress in determining the accuracy and reliability of energy data. 14/

11/ PART Report, 1979, p. 21.

12/ Ibid., p. 21.

13/ Ibid., p. 22.

14/ Ibid., p. 22.

In response to the PART Report, EIA Administrator, Dr. Lincoln E. Moses tended to agree with the PART assessment of the contract problems, noting that "the pilot studies did not progress as well as had been hoped, which is indicative of the difficulty involved in developing validation methodology." He also made the point that the pilot studies were not the only projects that OEIV had been involved in during the period under evaluation:

> In its first year of existence the Validation Office made substanial progress, with a small staff, in areas which we identified early in 1978 as those requiring immediate attention. These include: (1) establishing and staffing a working organization; (2) developing validation methodology; (3) reviewing 130 proposals for new or revised data collection forms, which resulted in technical improvements in the final forms and survey plans; (4) assisting in the development of the Oil and Gas Information System to improve the system's design prior to implementation; (5) conducting in-house analysis of information requirements, such as in support of the Economic Regulatory Administration and Federal Energy Regulatory Commission efforts prior to implementation of the National Energy Act. The primary objective was to carry out critical reviews of new or revised systems and forms prior to their implementation, since it is far less disruptive in the short-term and far more effective in the long-term to correct problems prior to implementation rather than after. 15/

For the period April 1979 to June 1980, PART, in evaluating the energy information validation efforts of EIA noted that,

> EIA established an Office of Energy Information Validation and developed a program plan for the Office in February 1979 which laid out its overall mission and a strategy for accomplishing eight preliminary tasks. However, PART found that as of the time of this review no priorities have been assigned to these tasks and the Validation Office has produced only limited validation efforts.
>
> The three studies completed by the Office and examined at the time of PART's fieldwork do not go far enough to address all of the issues which in PART's judgement form the basis of a thorough validation study. The studies are useful in calling attention to problem areas, but they provide only limited quantification of the level of error.

15/ Ibid., p. 45-46.

> PART believes that because of limited validation efforts conducted thus far, the accuracy of most energy information is undetermined. 16/

PART's report went on to make four recommendation about the validation efforts in EIA. These were the following:

> Establish priorities for the eight primary tasks enumerated in OEIV's program plan to ensure that, with the limited resources available, attention is directed to the most important tasks so that the energy information being published is as accurate as possible.
>
> Adjust the time frames in the program plan to more realistically reflect what can be accomplished given the expected level of staff resources.
>
> Improve the quality of validation studies by requiring, to the extent practicable, that the studies provide a framework and better quantification of results and by providing a section in each validation report which presents quantification of results.
>
> Decide which group should develop model validation standards. 17/

In response to the PART report, EIA generally agreed with PART's recommendations about energy information validation, but strongly disagreed with PART's analysis of the three validation studies reviewed by PART as well as disputed the view that the accuracy of much of the energy information is undetermined. 18/

Validation and Verification

Another issue that appears to have plagued EIA is its focus primarily on statistical validation rather than verification. Statistical validation, which may include some field audits, generally tries to determine the accuracy of a statistical data set. Such an analysis might include determining the amount

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16/ PART Report, 1980, p. ii-iii.

17/ Ibid., p. iii.

18/ Ibid., p. 57-61.

of sampling error for estimates derived from the data set, determining non-sampling errors--errors in questionnaire construction, response biases, interviewer biases, etc., indicating the processing errors, and trying to quantify these errors so that the quality of any estimate made from the data set can be determined.

Verification, on the other hand, usually focuses on all the cases individually; it is an audit of the information supplied by every respondent. Because verification requires checking the accuracy of all individual respondents' answers--rather than the accuracy of the data set as a whole--it tends to be quite costly. However, if one is collecting information for regulatory purposes and concerned with enforcing the law with respect to individual respondents, verification is the only way to determine that the information provided by the respondent is correct and that he or she is not in violation of the law.

Part of EIA's mandate was to collect statistical as well as regulatory information for the regulatory agencies involved in the energy area. As mentioned earlier, information supplied by the energy industry was mistrusted by both the public and some Members of Congress. Thus, much of the initial concern with the accuracy of energy information centered around the verification of information about individual firms in the energy industry.

EIA deemphasized the verification of information on a case by case basis. They mostly focused on validation and verification of whole energy data sets rather than trying to determine the accuracy of each respondent's answer to one of its questionnaires. According to Charles S. Smith, then

Assistant Administrator of Energy Information Validation in a CRS sponsored energy information workshop, "classical verification and auditing is probably the least important thing that we do." 19/

At that same workshop, some users of EIA data, especially Congressional users, noted the problems caused by not focusing on verification. Michael Woo, Energy Research Analyst of the Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce, recommended a "need to assure credibility, and I think this is where you need the verification and audits that Charles Smith was talking about. It doesn't even necessarily have to be done on a full basis, but it needs to be done on an on-going basis, probably at least on a sampling basis." 20/

Ronald Kutscher, Assistant Commissioner, Bureau of Labor Statistics, suggested that the conflict between validation and verification in EIA might derive from the conflict between collecting information for a regulatory purpose and collecting information for a statistical purpose. 21/

In general, the emphasis at EIA on statistical validation overshadowed the emphasis on verification, or auditing of individual cases, during the early years of its existence. With the current Administration's deemphasis of regulatory activities, it is possible this conflict may become moot.

19/ U.S. Congress. Senate. Committee on Governmental Affairs. Energy Information: A Workshop on Current Progress and Problems. Committee Print, 96th Cong., 2d Sess., Prepared by the Congressional Research Service, Library of Congress. Washington, U.S. Govt. Print. Off., 1980. p 45.

20/ Ibid., p. 48.

21/ Ibid., p. 45.

Overall Summary of the Validation Program Between 1977 and 1981

An Office of Energy Information Validation was established just after EIA was created. It was headed by an Assistant Administrator who reported directly to the Administrator. Between 1977 and 1981 there was a commitment to creating a strong validation program so that the credibility of energy information produced or compiled by EIA would not be questioned.

While this commitment was never questioned by the PART reports that evaluated EIA's activities, the EIA validation efforts, in PART's view, were useful preliminary efforts but did not meet the criteria for energy information validation that PART decided was acceptable. PART noted that in the first year of EIA's existence, this was most likely the result of EIA not having an overall program plan for data validation. After OEIV established such a plan, PART praised this as a first step, but felt that priorities should be established in the plan and adequate staff should be made available for more validation efforts.

EIA, in many respects, appears to have agreed with the proposals advanced by the PART and made efforts to carry out the proposals, while disagreeing with the specific criticisms of its validation efforts. EIA also noted that it believed a primary focus should be placed on information requirements and approaches before data were collected so that problems with the data might be dealt with before the information was collected. PART appears to have disagreed with this focus. PART stressed the need to validate the quality of energy data already collected and being used by the individual energy analyst.

DE-CONTROL, BUDGET CUTS, AND REORGANIZATION

Three Reagan Administration policy changes have had an impact on the validation efforts at EIA. First, de-control of the oil industry has meant

that many of the forms used by EIA to collect information for the regulatory agencies in this area no longer exist. Consequently, there is less information to validate. Second, the FY1982 budget for EIA, and for the validation efforts in particular, was greatly cutback from what had been proposed by the Carter Administration. Third, EIA was reorganized in July 1981. The effect of the reorganization on the validation program was to decentralize validation efforts and to place more emphasis on quality assurance rather than on large scale validation efforts.

De-Control of the Oil Industry

With de-control of the oil industry came a major cutback in the amount and detail of information needed for regulatory activities in this area. According to a working document presented by EIA to the American Statistical Association Committee on Energy Statistics in October 1981, 15 forms out of 39 in EIA's Petroleum Series were being revised as a result of de-control. As stated in this working paper,

> With decontrol, EIA's dependence on regulatory forms returned by a census of respondents will disappear and strategies must be developed for time-series sampling that will be cost-effective in terms of burden relative to precision, and will improve timeliness by reducing the number of forms to be processed. 22/

To the extent that the reevaluation of what data should be collected eliminates energy information series, there will be no data series to validate. However, even if the data series are scaled back to sample data series rather than

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22/ Energy Information Administration. EIA's Activities to Improve Information Quality. A working document prepared by the EIA in order to solicit advice and comment on statistical matters from the American Statistical Association Committee on Energy Statistics. Meeting to held October 22-23, 1981. p. 14, 21-23.

censuses, the problems of determining the accuracy and reliablilty of the data series will still remain.

EIA Budget Constraints

As a result of the Reagan Administration's desire to reduce the regulatory activity of the Federal Government in the area of energy, the Federal role in making energy policy, and the reporting burden of the energy industry, efforts at collecting energy information by EIA have been affected by a substantial reduction in its budget.

In FY1981, $90.4 million was appropriated for the operation of EIA. The initial request submitted by the Carter Administration for FY1982 was for a total of $127.2 million for the operation of EIA. The Reagan Administration requested $70.4 million for the revised FY1982 budget for EIA and $78.9 million was appropriated. The current requested FY1983 budget for EIA is $54.5 million. Thus, the change in budget from FY1981 to FY1982 was a drop of $11.5 million or a 12.7% decline during this period. The proposed change between the FY1982 budget and the FY1983 proposed budget for EIA is $24.4 million decline or a 30.9% drop. Over the entire period from FY1981 to FY1983, EIA's budget will drop by $35.9 million dollars or about 40%. 23/

23/ The FY1982 Carter request for EIA and the FY1982 Reagan request come from the 1982 PART Report. Professional Audit Review Team. Report to the President and the Congress. Performance Evaluation of the Energy Information Administration, Department of Energy. May 19, 1982. Washington, D.C. p. 8, 15. The other budget figures come from the House Appropriations Committee Hearings on EIA's budget. See U.S. Congress. House. Committee on Appropriations. Subcommittee on the Department of the Interior and Related Agencies. Department of the Interior and Related Agencies Appropriations for 1983. Hearings, 97th Cong., 2d Sess., Part 2, Justification of the Budget Estimates. Washington, U.S. Govt. Print. Off., 1982. p. 1314-1322. (Hereafter noted as the Justification of the 1983 Budget Estimates)

Budget allocations for FY1982 and proposed budget reductions for FY1983 for energy validation have even been more severe. In FY1981, the budget authorization for information validation was $8.4 million. The Carter Administration request for FY1982 for information validation was $14.1 million. The FY1982 appropriations for information validation--now located in the new Office of Statistical Standards (OSS)--was $2.6 million dollars. The FY 1983 budget request for OSS is $0.6 million dollars, of which about half will be going to the Office of Quality Assurance (OQA) for data quality assurance. 24/ In FY1982, the new Office of Quality Assurance within the Office Statistical Standards had a budget of $1.5 million and a staff of 14 professionals. Under the FY1983 proposed budget, the whole of OSS will have a budget of $.6 million and a total staff of 17 full-time equivalents. 25/

EIA's Reorganization

In July 1981, EIA was reorganized because of the budget constraints of the Administration's proposals as well as the Administration's different emphasis on energy data needs. Two consequences appear to have come out of the

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24/ All figures except for the Carter FY1982 budget request for information validation and the proportion of funds going to OQA under the proposed FY1983 budget come from the Justification of the 1983 Budget Estimates, p. 1318. The Carter FY1982 are found in the PART Report, 1982, p. 8. The figures for OQA were provided over the telephone by Dr. Yvonne Bishop, Director of the Office of Statistical Standards. It should be noted that under the new organizational structure of EIA, program offices are also responsible for quality control efforts. It is possible that some of the funds needed for information validation might be made available through the program offices. However, as of December 1981, when PART completed its evaluation, no budget allocation for such validation efforts could be found within the individual program offices. See PART Report, 1982, p. 36.

25/ PART Report, 1982, p. 35 and The Justification of the 1983 Budget Estimates, p. 17.

reorganization for energy data validation. First, energy data validation was deemphasized and relegated to a focus on quality assurance. Second, responsibility for quality control was placed in the hands of three new program offices with the new Office of Statistical Standards being responsible for the development of quality control standards and monitoring compliance with such standards. In other words, the quality of the data would be the responsibility of those who collect and analyze the data rather than of an independent group that would assess the validity and reliability of the information collected.

According to the EIA working paper presented before the American Statistical Association's Committee on Energy Statistics, the reorganization reflects several major principles:

> Normative issues, such as what data should be collected, are separate from the technical problem of describing actual information quality.
>
> Standards are to guide information production activity.
>
> Quality control, which ensures that the information product corresponds to explicit specifications, is the responsibility of the program office. However, it is not enough to make the individual office "responsible": specialized, technically skilled people are made available through an office of statistical support to help the program office.
>
> Quality assurance, which appraises the objective properties of the resulting energy information, is predominantly a technical activity. It is not focused on either EIA management, data requirements, or current issues of management. It assesses the extent to which quality control procedures are effective, and develops new procedures for quality control.
>
> The forms clearance process will be used to ensure that data system problems are remedied. 26/

As of the October working paper, EIA had also established five major tasks for improving the quality of energy information. These are the following:

> Continue documentation and archiving of energy models and data systems.

26/ EIA, Activities to Improve Information Quality, p. 1-2

> Complete the twenty ongoing Data Validation and Requirements Projects and the two remaining Model Validations, and implement their recommendations to the extent resources permit. (See Appendix)
>
> Continue to improve sampling frames.
>
> Catalogue, test and expand the use of automatic data editing procedures, verification checks, and diagnostics on EIA data systems and models.
>
> Evaluate the natural gas data and forecasting models as part of EIA's periodic validation of energy data systems. 27/

Based on the money available in the proposed FY1983 budget allocations, many of these projects may not be completed. According to the FY1983 budget justification, the over $2 million dollar decline in the budget request for OSS reflects a

> Reduction in validations and quality assessment reviews of data and models; elimination of field audits, and further development efforts on the data resources directory; reduction in forms clearance, statistical design, statistical procedures, and formation of major frame updates. 28/

Also, Dr. Yvonne Bishop, Director of OSS at EIA noted that unless validation studies were to be performed by program offices--which had their own budgetary problems--no validation studies could be conducted. 29/

Apart from the purely budgetary reasons for such changes, EIA officials have several reasons for this approach. Dr. Bishop stated that one reason for the deemphasis was that after finding the problems with a certain data series (e.g., leaving out a relevant population group for a study), the need for reexamining that data series declines. Periodic reviews of the data series

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27/ Ibid., p. 3.

28/ Justifications of the FY1983 Budget Estimates, p. 1318.

29/ Telephone conversation with Dr. Bishop, August 2, 1982.

every five years might prove useful to gauge changes in the impact of the marketplace, but a new examination every year is viewed as being probably not cost-effective. Thus, as more and more data series are examined and the problems with them are dealt with, fewer people need to be involved in this sort of work. OEIV contributed much in finding the problems with many of the energy data series. Therefore, Dr. Bishop noted that the need for a large organization within EIA to continue this work is reduced. 30/

However, according to the three PART Reports, a full-scale validation of the EIA energy information series has not been done. While validation reports have been issued for seven of the 40 energy information series remaining at EIA, none of these, according to PART, have fully quantified the errors associated with the estimates derived from the information series. 31/ But as Dr. Bishop points out, a full-scale validation study aimed at producing quantified results like those desired by PART is usually very costly and takes a substantial amount of time. 32/ Given the budget allocations for assuring the quality of data series, it would not appear likely that such full-scale validation studies will occur in the near future.

EIA now also feels that decentralization of quality control serves several useful functions. First, the old OEIV office, because it functioned independently dently of the rest of the program offices, often was viewed more as a potentially threatening entity and "less as an insurer of the integrity of existing data and analysis systems." Second, program offices often have a difficult time "adopting recommendations in which they had little say." Third, while a separate

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30/ Ibid.

31/ PART Report, 1982, p. 34.

32/ Telephone conversation with Dr. Bishop.

entity like OEIV might mean more independence and objectivity, the separation of such an office from the day-to-day problems of collecting and analyzing the data would often lead to irrelevant proposals. And fourth, "the new organization recognizes the difference between the political problem of what should be done and to what standard, and the technical problem of describing what is known objectively about information." 33/

On the other hand, without some office having the responsibility for quality control functions and having to report the results of such studies, it is possible that no such studies will get done. Program officers may feel that the money would be better spent collecting the data rather than determining whether or not the information collected is valid and reliable. Program officers are responsible for producing the data. Without a separate office responsible for producing evaluation, some might argue, there is no incentive to conduct costly quality control. As the PART Report notes,

> . . . future validation studies will be performed by and at the discretion of individual EIA program offices rather than on a comprehensive basis by EIA personnel specialized in this function. Likewise, the amount of validation work performed in each study will be determined on a case-by-case basis, whereas the Office of Energy Information Validation had planned to perform a complete validation of all existing systems and to update the validations on a 5-year basis. 34/

Also, a decentralized structure that places the responsibility for quality control in the program offices might experience another difficulty. It is the responsibility of the program office to produce information on a timely basis. Quality control measures often will slow down the pace of producing data that

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33/ EIA, Activities to Improve Information Quality, p. 6-7.

34/ PART Report, 1982, p. 34.

can be timely and useful for specific purposes. Thus, some might argue that the potential conflict between these two goals may lead to less emphasis on quality control.

It also should be noted that one of the responsibilities of OSS is to monitor the program offices to assure that quality control efforts are being made. The difficulty is that the large budget reductions in OSS may mean that the resources necessary for such monitoring will not be available.

PART's 1980-1981 EIA Evaluation

The most recent PART evaluation of EIA's activities covering the period July 1980 to December 1981 notes the decline in importance of the energy data validation function within EIA due to the budgetary constraints.

> Although the validation of its energy information had been EIA's top priority, the administration's revised budget proposal for fiscal year 1982--and Congressional action on this proposal--were particularly severe in the validation area . . . . . .
>
> In place of validation efforts, EIA is emphasizing the primary role of its program offices in developing systems of internal control to maintain quality products. 35/

The PART Report makes specific mention of several problems in the data validation area. First, EIA had not developed "uniform standards for validating its systems or for assessing its models," as of December 1981. Second, although EIA has developed a set of reporting standards for its publications, PART found that "the standards are not being consistently followed. As a result, user's of EIA's publications have not received adequate information in several key areas, including the design of the survey, quality of the data, and possible errors in the data." 36/

35/ Ibid., p. 35.

36/ Ibid., p. 33.

While PART notes that since its last review, EIA had issued four additional validation studies, the Report goes on to note that,

> in the three studies dealing with the joint petroleum reporting system, prime suppliers, and monthly power plants, no quantification of the level of error is provided. In the fourth study, which deals with crude oil entitlements only, a limited quantification of the error level is provided. Therefore, the results of these validation studies do not enable users of EIA's data to determine whether a specific statistic is unbiased or contains a certain amount of error. 37/

In assessing the whole effort of EIA in validating the various energy data series for which it is responsible, the Report notes that,

> As of December 1981, 33 of EIA's existing 40 information systems had not been validated. Even though EIA is in the process of finalizing four validation studies, its emphasis on this function--which was EIA's first priority in February 1981--has been scaled back drastically. 38/

In the area of energy model validation and the status of EIA's efforts since its inception, the PART Report states that,

> In addition to validating its information systems, EIA has the responsibility for assuring data quality by assessing its models that are used to project energy data. In our November 1980 report, we pointed out that EIA intended to complete these efforts by 1986 but, based on the little progress that had been made, we stated that it was doubtful that the target date could be met. Our current work substantiates that view. As of December 1981 EIA had fully documented only one of its 60 models and had not assessed any of them. Further, EIA has yet to develop standards for assessing its models. 39/

In response to the criticisms of the PART report, EIA generally agreed with PART's recommendations. J. Erich Evered, EIA Administrator, responded to PART's view on data validation by stating the following in March 1982:

37/ Ibid., p. 34.

38/ Ibid., p. 34.

39/ Ibid., p. 34.

> In the areas of validation, quality assurance, and statistical standards the Office of Statistical Standards will continue to develop standards and work with line managers responsible for data systems, models, and publications to ensure effective implementation and the maintenance of high quality products. EIA will continue to weed out systems which are unnecessarily complex and to improve operation procedures to reduce any problems from those sources. Quality control, distinguished from quality assessment, has been and will remain an important primary responsibilty of line managers. The Office of Statistical Standards will provide quality assessment in carrying out its overall responsibilities. 40/

It should be noted that subsequent to the PART's study, OSS and the heads of the various program offices within EIA have reached a consensus on a standards program within EIA. 41/

POSSIBLE IMPACT OF THE PASSAGE OF THE EIA AMENDMENTS OF 1981 ON ENERGY INFORMATION VALIDATION

As part of its FY1983 budget request, in May 1981, EIA submitted to Congress major proposed legislation that would repeal energy information requirements under several laws to enable EIA to reduce costs. The bill was introduced by Senator McClure in the Senate (S.1218) and by Congressman James Collins in the House (HR. 5923).

To reduce costs at EIA, the proposed legislation: (1) enables EIA to obtain confidential information from other Federal agencies, including the sharing of sampling frames that would contain the names of potential persons or firms that are involved in the energy field; (2) enables EIA to protect statistical energy information from disclosures for nonstatistical purposes; and (3) modifies or eliminates several major reporting requirements.

40/ Ibid., p. 49.

41/ Telephone conversation with Dr. Bishop.

More specifically, EIA would no longer have the responsibility for the establishment of the Financial Reporting System nor would it be required to establish a State-level middle distillate monitoring system. By allowing EIA to restrict access to information that was collected for statistical purposes from disclosure, information that is collected by other Federal statistical agencies under strict confidentiality rules would become available to EIA. This would mean that duplication of data collection efforts could be reduced and burdensome reporting requirements could be minimized. Further, by protecting the confidentiality of the data at EIA and allowing for this sharing among agencies, EIA would be able to get access to sampling frames developed and validated by other Federal statistical agencies. This would save EIA time, money, and the need to validate its sampling frame because EIA would not be reinventing the wheel. Elimination of the responsibility to collect energy information would mean that such data series would not need to be validated.

Apart from the obvious impact that reduced information collecting requirements would have on data validation, there are two aspects of the proposed legislation that may effect the energy data validation efforts at EIA. First, the ability to protect statistical information from disclosure may allow EIA to make use of the sampling frames of firms developed at the Bureau of Labor Statistics (BLS). Not only would this enable EIA to make use of an established list of firms to draw its sample--a list that BLS continues to monitor and verify its quality--but almost as important, it would mean that both BLS and EIA could be assured of the fact that the universe of firms for their studies was the same. Problems of incompatibility in analyses of the impact of energy on general social and economic conditions would be minimized.

On the other hand, it appears that the proposed legislation, because it fails to amend the confidentiality provisions relating to the Bureau of the Census in Title 13, would not give EIA access to any of the data collected and compiled by the Bureau of the Census, including their lists of manufacturing firms and establishments, which would prove useful for the same reasons that access to the sampling frames of BLS are useful.

Apparently, the reductions in the FY1983 budget requests as well as the reductions in the allocations for energy information validation assume the passage of the EIA Amendment of 1981 bill. It is unclear what the consequences for EIA and for energy validation functions at EIA might be if this legislation is not passed, but the requested budget cuts are provided.

APPENDIX 42/

TABLE 1: Data Validation Studies

June 1981

Title	Data Series Covered
Completed	
Validation of the Capacity of Petroleum Refineries System	EIA-177
Validation of the Natural Gas Curtailments System	EIA-50
Data Validation Study of the Prime Suppliers Monthly Report	EIA-25
Validation of the Joint Petroleum Reporting System	EIA-87 EIA-88 EIA-89 EIA-90
Validation of the Monthly Power Plant Report System	FPC-4
Underway	
Monthly Report of Cost and Quality of Fuels for Electric Plants	FPC-423
Boiler Manufacturers Report	ERA-97
Coal Production	EIA-7A
Supply and Disposition of Natural Gas	BOM 1340/1341 (now EIA-176)
Report of the Supply and Requirements of Interstate Pipelines	FERC-16
Natural Gas Liquids/Synthetic Natural Gas	EIA-64 EIA-19
Market Shares	EIA-9A, 9B EIA-460 FEA-P306 FEA-P314 FEP-P315
Oil Import - Quarterly	ERA-60 P-133-M-0
Oil and Gas Information System	EIA-23***
Incremental Price Monitoring Report	EIA-194**
Natural Gas Policy Act System	EIA-149*.
FPC 4 Special Issues	FPC4
Crude Buy/Sell	ERA56 ERA57
Underground Storage	FPC8 EIA191
Fuel Oil and Kerosene	EIA172

* One time data collection
** System not considered a basic data series
*** One report completed, continuing effort

42/ EIA, Activities to Improve Information Quality, p.12, 18-24. Please note that these tables may not reflect the changes that may occur because of FY1983 budgetary constraints.

Table A-1: Electricity Series Coverage

Type of Form	Form Number	Title	Basic Data Series	Validation Status
As Needed Forms	ERA-316	Petition for Temporary Use of Natural Gas		N
"	ERA-318	General and Special Cost Tests for New Installations (Petition)		N
Annual Forms	FPC-1	Annual Report for Large Private Electric Utilities	X	N
"	FERC-1F	Annual Report for Small Private Electric Utilities	X	N
"	ERA-412	Annual Report of Municipal Electric Utilities	X	N
"	FPC-12	Annual Power System Statement	X	
"	FPC-67	Steam Electric Plant Air and Water Quality Control Data	X	
"	EIA-213	Annual Report on Typical Net Monthly Bills	X	
Monthly & Annual Forms	ERA-119A	Annual Projection of System Changes	X	
	ERA-119M	Monthly Report of Electric Energy Capability and Peakload	X	
Monthly Forms	FPC-4	Monthly Power Plant Report	X	C
"	FERC-5	Electric Utility Company Monthly Statement	X	N
"	FPC-423	Monthly Report of Cost and Quality of Fuels for Electric Plants	X	U
"	ERA-160	Monthly Electric Utility Generation and Fuel Planning Report		
"	EIA-101	Monthly Electric Bill Data		

Validation Status Codes: C = Completed
U = Underway
N = Not appropriate for validation

Table A-2: Coal Series Coverage

Type of Form	Form Number	Title	Basic Data Series	Validation Status
Annual Forms	EIA-7A	Coal Production Report	X	U
Monthly & Annual Forms	EIA-5(5A)	Coke and Coal Chemical Materials Monthly (Annual) Rpt	X	
Quarterly	EIA-3	Quarterly Coal Consumption Report - Mainufacturing Plant	X	
"	EIA-6	Coal Distribution Report	X	

Validation Status Code: U = Underway

Table A-3: Natural Gas Series Coverage

Type of Form	Form Number	Title	Basic Data Series	Validation Status
As Needed Forms	FERC-121	Interim Price Tracking System		N
"		Natural Gas Act Centralized System		N
"		Rate Refund Report System		N
Annual & One Time Forms	FERC-122	First Sales of Natural Gas		N
"	FERC-123	Initial Rpt of First Sale of Natural Gas		N
"	FERC-124	Report of First Sale of Natural Gas under Sec 106(B)		N
Annual Forms	FERC-2	Report of Large Natural Gas Pipeline Companies	X	N
"	FERC-2A	Report of Small Natural Gas Pipeline Companies	X	N
"	FPC-14	Report for Importers and Exporters of Natural Gas	X	U
"	FPC-15	Report of Gas Supplies of Interstate Natural Gas Pipeline Companies	X	U
"	EIA-50	Alternate Fuel Demand Due to Natural Gas Curtailment	X	C
"	EIA-176	Supply and Disposition of Natural Gas	X	U
Semiannual Forms	FERC-16	Report of the Supply and Requirements of Interstate Pipelines	X	U
Monthly Forms	FERC-11	Natural Gas Pipeline Monthly Statement	X	
"	EIA-19	Synthetic Natural Gas Plant Report	X	U
"	EIA-64	Natural Gas Liquids Operations Report	X	U
Month/Semi-Monthly Rpt	FPC-8	Underground Gas Storage Report	X	U
"	EIA-191	Underground Gas Storage Report	X	U
Weekly Emergency Situations	EIA-81	Gaseous Fuels Emergency Telephone Survey		N

Validation Status Codes: C = Completed
U = Underway
N = Not appropriate for validation

Table A-4. Petroleum Series Coverage

Type of Form	Form Number	Title	Basic Data Series	Validation Status
Annual Forms	EIA-171	Sales of Asphalt and Road Oils		
"	EIA-172	Fuel Oil and Kerosene Sales	X	U
"	EIA-174	Sales of Liquid Petroleum Gases	X	U
"	EIA-177	Capacity of Petroleum Refineries	X	C
Monthly Forms for	EIA-142	International Energy Agency Supply Report		
Monthly & as Needed Forms	#ERA-69	Crude Oil Reseller Self Reporting Form		
Monthly	#EIA-9A	No. 2 Distillate Price Monitoring Report	X	U
"	EIA-9B	No. 2 Fuel Oil Telephone Price Monitoring		
"	#EIA-14	Refiners' Monthly Cost Allocation Report	X	
"	ERA-51	Transfer Pricing Report		
"	EIA-67	Foreign Crude Oil Cost Report		
"	EIA-194	Monthly Alternate Fuel/Incremental Price Monitoring Rpt		C
"	#EIA-460	Petroleum Industry Monthly Report for Product Prices	X	U
"	#FEA-P306	Monthly Report of Refiner/ Importer Distribution	X	
"	#FEA-314	Monthly Survey of Distillate & Residual Sales to Ultimate Consumers	X	

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Monthly (con't)	#FEA-315	Monthly Surveys of Propane Sales of Ultimate Consumers	X	
"	#SG-1	Survey of Gallonage Sales of Gasoline	X	N
"	#SG-2	Survey of Gallonage Sales of Gasoline	X	N
"	#SG-4	Survey of Gallonage Sales of Gasoline	X	N
"	#SG-7	Survey of Storage Capacity of of Motor Gasoline		N
"	#ERA-59	Standby Mandatory Crude Oil Allocation Program Report		
"	#EIA-25	Prime Suppliers Monthly Report	X	C
"	EIA-87	Refining Report	X	C
"	EIA-88	Bulk Terminal Stocks of Finished Petroleum Products	X	C
"	EIA-89	Pipeline Products Report	X	C
"	EIA-90	Crude Oil Stocks Report	X	C
"	#EIA-169	Prime Suppliers Three Monthly Projection of Total Supply and Stocks		
"	EIA-170	Tanker and Barge Shipments of Crude Oil and Petroleum Between P.A.D. Districts	X	
"	EIA-456	Crude Oil Ownership Report	X	
"	#ERA-182	First Purchaser System		
"	ERA-60	Report of Oil Imports into the US and Puerto Rico	X	
"	P-133-M-0	Shipment of Refined Petroleum Products from Puerto Rico to the U.S.	X	

Monthly (Cont'd)			
"	IEA Questionnaire A, IA-401	The International Energy Emergency Reporting System	
Weekly Forms for Emergency Situations	EIA-175A	Bulk Terminal Stocks of No. 4 and Residual Fuel Oils by Sulfur Content	
Weekly Forms	EIA-161	Weekly Refinery Report	X
"	EIA-162	Weekly Bulk Terminal Stocks of Finished Report	X
"	EIA-163	Weekly Pipeline Stocks of Finished Products	X
"	EIA-164	Crude Oil Stocks Report	X
"	EIA-165	Imports Report	X

Validation Status Codes: C = Coverage
U = Underway
N = No appropriate for validation

Forms being revised in response to decontrol.

Table A-5: Other Series Coverage

Type of Form	Form Number	Title	Basic Data Series	Validation Status
Annual	CS-462	State Energy Conservation Program		
"	EIA-23	Annual Survey of Domestic Oil and Gas Reserves	X	U
"	EIA-84	Residential Energy Consumption Survey	X	
Semi-Annual Forms	EIA-63	Solar Collector Manufacturing and Importers Data System		
Quartery Forms	FEA-U502-Q-0	Federal Energy Conservation Performance Report		

Validation status code: U = Underway

APPENDIX

ISSUES AND PROBLEMS CONNECTED WITH CONTRACTING AT THE ENERGY INFORMATION ADMINISTRATION*

Throughout EIA's existence, since DOE was established in October of 1977, between 65 and 75 percent of its budget has been expended on contract work. The present level is 65 percent paid to contractors, and 35 percent for in-house expenses. In 1981, with the advent of the Reagan Administration's new approaches to the programs of the Department of Energy, the budget of EIA stopped growing, and has since been considerably reduced. As the budget has been cut, so have the OMB-imposed personnel ceilings; and so the contracting level has remained at a relatively constant level.

This report will briefly summarize the issues that have been raised in the past, discuss how those issues appear under the current administration, and then comment on remaining problems identified by the Professional Audit Review Team (PART) 1/ in its 1982 report on EIA. 2/

CONTRACTING PROBLEMS IN THE PAST

During the first 3 years of EIA's existence, roughly until the end of 1980, the agency was in the throes of getting organized, responding to a wide variety

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1/ The PART is an interagency team established by law to review and evaluate EIA programs, and to report annually on its findings.

2/ It was beyond the scope of this report to examine the actual contracts let by EIA or to assess the nature of these contracts. Spokesmen for EIA, commenting on this matter, have been reliable sources of accurate information in the past, but CRS did not attempt to substantiate these comments.

of difficult and complex demands placed upon it by various laws. During this period, many of its current systems and reporting mechanisms were in the design phase; many of its personnel were new; some key positions were just being filled, and others were vacant. 3/ A major problem connected with contracting during these early years was identified by the PART report of 1979, which criticized the contracting out of key functions appropriate to management, such as setting agency goals, and doing basic system design. 4/

Most observers of EIA saw a need to eliminate the contracting out of such key functions. As discussed below, as the agency has gained needed personnel with expertise, these types of functions--design of systems, identification of goals--are now done in-house, and not by contractors, according to agency spokesmen.

EIA reportedly has had a continuing problem with personnel levels, however. These have been set at a relatively low ceiling, compared with other statistical agencies. In particular, the wide range of tasks demanded of EIA immediately upon its inception, and its large budget relative to numbers of personnel, made contracting the agency's only option in some instances. Table 1 shows comparative personnel and budget levels for the EIA, Bureau of Labor Statistics, and Bureau of the Census.

3/ In 1980, turnover was a serious problem: An average of 35 percent of EIA's top positions were unfilled or carried out by acting officers. This reflected an on-going situation. See Oversight of the Structure and Management of the Department of Energy. Staff Report, Committee on Governmental Affairs, U.S. Senate. Govt. Print. Office, Washington, D.C. December 1980, p. 142.

4/ See Professional Audit Review Team. Activities of the Energy Information Administration. Report to the President and the Congress. May 7, 1979. Washington, D.C., pp. 11-12.

TABLE 1. Comparison of Budgets and Personnel: Bureaus of Labor Statistics, Census, and EIA (in millions of dollars)

	Personnel	Budget Authority	Reimbursable	Total Budget
Bureau of Labor Statistics				
FY 1980	1,884	$103.6	$11.5	$115.2
FY 1981	1,943	107.4	11.7	119.2
Census (excluding decennial census)				
FY 1980	2,036	53.7	74.5	128.3
FY 1981	2,067	58.2	74.7	133.0
Energy Information Administration				
FY 1980	815	88.2	*	88.2
FY 1981	882	116.2	*	116.6

* None.

Source: The Budget of the U.S. Government, 1981. Appendix; U.S. Govt. Print. Office, Washington, D.C., 1980.

The EIA management, also concerned about the high proportion of work done by contractors, made a strong pitch in 1980 for additional personnel to do more of their work in-house. In August 1980, EIA completed a Manpower Utilization Survey the purpose of which was to assess requirements for conversion from contract to in-house personnel work. The final report stated in its introduction:

> EIA requested new positions in fiscal year 1982 to replace contractor support. The basis for this request is the continuity of program knowledge, i.e., Federal employees will have the advantage of establishing and maintaining an institutional memory. There has also been strong congressional concern regarding the high level of contract costs compared to the total EIA budget based on the type of activities the EIA conducts, and possible conflicts of interest . . .
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> The heavy reliance that EIA places on contractors for development of its professional products causes a great deal of concern among the EIA senior staff (over 66 percent of available funds go to contractors vs. 34 percent for in-house staff--fiscal year 1982 level).

Specifically, a reduction in contractor support offset by an increase in Federal employees would in their opinion:
Provide for continuity of program knowledge,
Eliminate the potential for conflicts of interest,
Facilitate program/project management,
Improve the credibility of EIA. 5/

In order to accomplish this conversion to in-house work and away from contracting, EIA proposed the addition of a total of 317 new positions by fiscal year 1984, with two alternatives for phasing them in--start with 287 new positions in fiscal year 1982, or 101 new positions in the first year. In fiscal year 1981, the Agency was given 65 new positions.

Observers of EIA report a number of problems connected with the high level of contracting, particularly when contractors are used in situations where in-house expertise should be governing decisions. Lack of institutional memory is one problem: Expertise developed by people who performed the task is not retained by the agency. EIA has lost in some instances what could have been a long-range benefit to its own staff in the learning process when important tasks are contracted out. If documentation is not extremely thorough, the system is not well understood by remaining personnel, once the contractor leaves the project; subsequent modifications become more difficult. According to EIA, such documentation was not usually provided in EIA's early projects.

In 1978, GAO found that there was no effective system to monitor, collect, and process information gathered or analyzed by contractors. Duplication and inefficiency become more possible, and there is a missed opportunity to input previously developed expertise into new systems.

5/ See Oversight of the Structure and Management of the Department of Energy, op. cit., p. 152.

Reduced ability to respond in a timely manner can be a problem when key tables are done by contractors. This is especially so if the agency must negotiate with an outside agency to do system design and reprogramming.

COMMENTS BY EIA ON CURRENT STATUS OF CONTRACT WORK

At the time the Reagan administration came into office, EIA had apparently passed through some of its worst adjustment and organizational problems and had begun to produce more timely and satisfactory information and analysis.

Currently EIA staff is at about 500. The management indicates that 490 is the minimum level to carry out the agency's mission, in terms of having expertise in all the needed areas. The Reagan administration requested a budget level of $54.5 million for FY 1983 and a personnel ceiling of 415. Congress is likely to give EIA roughly the same amount as last year--$79 million--for FY 1983. However, the personnel ceiling assigned to EIA by OMB may remain at 415 for FY 1983.

EIA contracting is currently at about the 65 percent level. With 490 personnel and a budget of $79 million, that is likely to remain about the same. With that budget and 415 personnel, contracting would have to increase. With 415 personnel and $54 million for FY 1983, EIA spokesmen say that contracting would not increase, but some elements of its mission would not be performed.

The personnel reductions to date, down about 400 people from the beginning of FY 1981, have been in administrative and computer programming personnel, and the number of analysts and energy experts has not yet been substantially reduced, according to EIA. However, the budget justifications for EIA request large reductions in personnel for key substantive areas, as listed in Table 2. Among other functions affected by cutbacks, the validation function, which was substantially contracted out, has been virtually eliminated.

TABLE 2. Requested Reductions in EIA Personnel for Key Substantive Areas, per Budget Justifications for FY82 and FY83

Substantantive Area	Full-time Equivalent Personnel FY82	FY83
Oil and Gas	206	171
Coal, Nuclear, Electric and Alternative Fuels	137	105
Energy Markets and End Use	123	62
Total, Collection, Production, and Analysis	466	338

Source: Budget Justification Document for EIA, FY 1983.

According to Al Linden, Deputy Administrator of EIA, there are advantages to the contract operations in their current mode. The concept design and system specifications are done by in-house personnel, and he is satisfied that in-house monitoring capability is at a good level.

EIA owns the computer equipment, but it is contractor-operated; keypunching is presently done by contractors. This has the advantage that unsatisfactory work can result in termination of services for the personnel doing this work. Such a mode has efficiencies as now operated, according to Mr. Linden.

Another former problem has been rectified, he indicated. There is now a centralized system for execution, monitoring, and collection of contract work.

CURRENT PROBLEMS IDENTIFIED BY PART

The 1982 PART report identifies a number of personnel-related issues, but does not directly comment on contracting as a problem. It notes the significant cutbacks and reorganization of the agency, listing a number of functions that will be dropped or curtailed sharply; it also notes that considerable reshuffling of personnel occurred in the course of these cutbacks and reorganization. This reshuffling, the report says, was not accompanied by an effective plan for or study of the actual personnel needs in newly organized offices. The PART report states:

> Because EIA has had limited experience working under the current organizational structure, we did not attempt to evaluate the efffectiveness or efficiency of the new organizational arrangements. However, we found that, in assigning its staff to the new offices, EIA gave inadequate attention to determining the number or types of skills each office needed.
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> The technical nature of EIA's mission makes it essential that it is staffed with the proper number and composition of professionals in a variety of specialized areas. The principal types of employees needed are statisticians, economists, operations research analysts, geologists, and data processing specialists. Even though EIA believed it was necessary to reorganize its functions to perform its work more effectively, it was unable to provide information showing how the new structure would be more effective or its rationale for determining the number of specialist positions of each type needed in the individual offices.
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> The Director of EIA's Planning and Evaluation Division told us that, a few months after the reorganization was effected, EIA's staff was being reallocated among the offices to smooth EIA's workload. EIA's current staffing plan reflects that reallocation; however, EIA still has not performed a study to determine the number and type of disciplines it needs to carry out its specialized responsibilities. 6/

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6/ Professional Audit Review Team, Report to the President and the Congress. Performance Evaluation of the Energy Information Administration. May 19, 1982. Washington, D.C., p. 9.

According to the PART report, planning problems are one aspect of the general problems entailed in the major redirection of EIA's purposes and organization instituted by budget cutbacks:

> EIA's planning difficulties have continued in the wake of operational changes resulting from the new administration's views on the need to alter the Federal energy information role. These changes have created an unsettled operational environment that is not unlike EIA's environment when it was instituted 4 years ago. 7/

> The redirection of the Federal energy role during the past year has resulted in a fundamental transformation in EIA, both in its structure and its operations. While we do not question EIA's decision that it could best respond to the new operational environment by organizing responsibilities for its functions, we believe that EIA gave insufficient attention to the staff requirements of its offices. Assessing the number and types of employees it needs to carry out its specialized functions should allow EIA to better ensure that its services are being effectively and efficiently delivered by each of its offices. It also should enable EIA to assess the impact of any future modifications to its activities and how it can best respond to them , both organizationally and operationally. 8/

SUMMARY

EIA continues to contract out more than half of its budget expenditures--65 percent currently. Throughout its history, it has had a similar or higher level of contracting. This has been a continuing source of concern to EIA and others, and EIA has in the past requested substantial increases in staffing in order to allow more in-house work. However, given the size of its budget, and the relative size of its staff, which is substantially smaller relative to its budget than is the case with other agencies with similar missions, a high level of contracting has probably been necessary; and it is unlikely that at any time

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7/ Ibid.

8/ Ibid., p. 12.

EIA could have performed all of its mission using in-house personnel. However, many of its problems in the past concerned the selection of tasks to be contracted. Vacancies and lack of expertise in early years led to performance of goal-setting and concept design by contractors. Significant losses in institutional memory and lost opportunity for learning were experienced.

After the initial settling-in period has passed, EIA administrators argue that these problems have been addressed and resolved. In-house personnel are now performing conceptual work and providing specifications. Contractors are monitored more effectively, and results are more carefully evaluated and collected, according to EIA. Advantages to contracting as it is now performed are said to include the ability to pay for products, and not the personnel connected with an effort after it is completed; more control over work, and ability to "fire" unsatisfactory contract employees; less commitment of staff to routine tasks that can be carried out without energy expertise as such.

If the budget continues at the current $79-million level and the personnel ceiling is reduced to 415, EIA spokesmen expect an increase in the amount of contracting; in addition, they indicate, employing fewer than 490 personnel would cut into the essential level of expertise and hinder the capacity of the agency to carry out its mission, even with a higher level of contracting. According to EIA, personnel level is the key variable in terms of ability to carry out the agency's mission, and with respect to retaining the ability to manage and design effective contracting.

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